BULLETIN
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Chicago Natural History Museum

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Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

ESPECIALLY FOR CHILDREN—

KLEEW. By Nikolaas Tinbergen. Oxford University Press, New York. 42 pages, illustrations by author. Price $1.50.

Kleew is the story of a sea gull, and the locale of his adventures in growing up and being born again might have been the shores of Long Island or islands in Lake Michigan quite as well as the sandy offshore islands of Holland. On even the most casual opening of the book, the variety and interest of the simple illustrations is intriguing. On further examination, the book proves to be an excellent introduction to bird study and indeed to natural history. And finally, on rereading, it is found to introduce the modern daughter-science of natural history—animal behavior—which is only a segment of natural history made scientific as it became critical.

For the reviewer, the little book has even more far-reaching significance. It represents an example of the truly great scientist writing a book for children in his own field of interest, and thus, even without intent, infusing into it something of his own enthusiasm and breadth of view. Nikolaas Tinbergen, editor of the journal *Behaviour* and Professor of Zoology at the University of Leiden, is one of the greatest of modern students of animal behavior, and it is thus a privilege to meet him. This privilege is now greatly extended, since we may meet him in the pages of the story of Kleew, quite informally, for the professor is in his field clothes and in the company of his children. "Kleew" is a good representation in our letters of the familiar loud cry of the herring gull.

It is noteworthy that this little book for children is a by-product of Dr. Tinbergen's stay in German prison camp as a result of his protest against the nazification of his university. One page of his weekly letter to his family was devoted to the text and illustrations of the sea gull's story.

Even the English text, by Dr. Tinbergen himself, reflects something of Dutch scholarship, since our colleagues in The Netherlands more commonly publish their serious papers in German, English, or French than in their own language.

Quite evidently *Kleew* is the book of the month for those young children (at a venture from years 3 to 10) who are fortunate enough to have a nature-lover, a naturalist, or a biologist among their parents or kin. It may perhaps require some such person to discern the merits of this little "classic" on the high-piled children's book counters. Once in the hands of a child, there can be no doubt of its instant success.

KARL P. SCHMIDT
Chief Curator of Zoology

FIRST 1949 EXEDITIONS: CUBA AND MEXICO

The Museum's first two expeditions for 1949 will be Botanical Expedition to Cuba, leaving January 3, and Mexican (Sonora) Archaeological Expedition, which will enter the field about the middle of January for three months of collecting.

Dr. B. E. Dahlgren, Curator Emeritus of Botany, and Dr. Hugh C. Cutler, Curator of Economic Botany, will spend more than two months in Cuba studying palms. They will travel by car wherever possible, carrying with them the plant presses, preserving fluids, and cameras necessary to make a record of the plants, and microscope equipment to study the plants in the field. In many parts of the tropics, palms are the most important plants, providing food, shelter, and even clothing to many natives. Yet because it is so difficult to collect and preserve specimens, palms have been studied very little in comparison with many other tropical plant families. For many years the Museum has been assembling a collection of palm material, until now in Hall 25 it has one of the best displays to be found anywhere in the world. Although some exhibition material will be collected on this latest expedition to Cuba, the major objective is to secure information on the differences between the different species of Copernicia palms, a group of which there are more kinds in Cuba than in any other region.

Mr. Donald Lehmer, a University of Chicago graduate student who was awarded the 1948–49 Museum fellowship by the university, will conduct the Sonora Archaeological expedition. It is sponsored jointly by the university and the Museum, and Arizona State Museum is co-operating by furnishing certain items of necessary equipment. In the state of Sonora, Mr. Lehmer will seek outcroppings of archaeological material dating back several thousand years and collect specimens that are of significance, but under agreement with the Mexican government the expedition will do no excavating. It is hoped that material will be found that ties up with that of the Cochise culture of New Mexico and Arizona discovered by the various Southwest archaeological expeditions of the Museum.

THIS MONTH'S COVER

A restoration of part of the ancient city of Chichen Itza in Yucatan, Mexico, depicting in miniature diorama form phases of the life of the Mayas about a thousand years ago, is the latest feature added to the Hall of American Archaeology (Hall B). A detailed article about this exhibit, depicted on the cover, will be found on page 3.

London Museum Head Here

Dr. Herman Shaw, Director of the Science Museum, London, and President of the Museums Association of Great Britain, and Mrs. Shaw recently visited Chicago Natural History Museum. They made a special study of the methods used here in maintenance and storage of materials. They had come to this country to accompany the original Wright brothers' airplane, the Kitty Hawk, on its return from England to the Smithsonian Institution in Washington.

Bulletin's 20th Year

This issue marks the beginning of the twentieth year and twentieth volume of the BULLETIN of the Museum (called *Field Museum News* during its first fourteen years and volumes).

Coming in February: 4th International Exhibit of Nature Photography.

RESTORATION OF CHICHEN ITZA, FAMED ANCIENT MAYA CITY

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

A MAYA diorama, in preparation for the past two years, was completed and installed in the Hall of American Archaeology (Hall B) in December. On this occasion, Mr. Elias Colunga, Mexican Consul in Chicago, made an official visit to the Museum for a preview of the exhibit, which represents a distinctive ancient culture of his country.

RUINS OF CASA COLORADA, CHICHEN ITZA

All that remains today of the magnificent Maya temple. The new Museum diorama, pictured on the cover of this Bulletin, shows it as archaeologists' studies indicate it appeared about A.D. 1000.

The Maya Indians of Mexico and Guatemala occupy a unique and prominent place in the panorama of American Indian cultures. The outstanding qualities of their architecture and art have long been recognized by those interested in the native peoples of Middle America. As the subject of the fourth and final diorama for the Hall of American Archaeology, the Department of Anthropology chose a section of the ancient Maya city of Chichen Itza, now deserted and in ruins, but once one of the flourishing Maya centers of northern Yucatan.

The Maya diorama has three predecessors in the same hall—an ancient Arizona cliff-village, an Inca town in Peru, and a prehistoric Louisiana Indian village. All four of these dioramas are designed to show visually what an Indian community was like at a time well before the disturbances caused by the arrival of white men on the shores of the New World. Together the dioramas afford the visitor a glimpse into the range of community life among the agricultural peoples of North and South America. The Arizona village is built into a giant cave set into the massive red cliffs of picturesque Canyon de Chelly in the arid Southwest. The Louisiana group shows an Indian community living along a cypress-lined bayou in the South. The Inca town is perched on the slopes of the towering, snow-capped Andes of Peru. And finally, the Maya diorama portrays part of a famous city set amongst the green jungles of the northern part of the peninsula of Yucatan. In all cases, the technique employed in showing how the Indians lived in these strikingly different environments has been brought to a state of near perfection of execution not heretofore realized in the ever-popular model diorama form of exhibit.

NOTABLE MAYA ACHIEVEMENTS

The origins of Maya civilization are still unknown, although archaeologists are patiently penetrating those early time horizons when the cultures of Middle America were slowly taking shape. However, by A.D. 1000—the approximate date of Maya life as shown in the diorama—Maya civilization had developed a distinctive form and pattern, a character and structure, of its own. Great temples of stone masonry had been erected; the crafts of pottery-making, textile manufacture, and the carving of stone were carried on; and the arts of sculpture and painting flourished. Extensive trading was conducted among the principal Maya centers. A numerical system had been devised that formed the basis of a calendar more accurate than our own. These facets of Maya life have been portrayed in the diorama and in two additional exhibition cases in the Hall of American Archaeology.

One of the principal interests of the ancient Mayas lay in a complex of culture traits associated with their religion. Maya cities were essentially ceremonial centers, consisting of clusters of stone masonry temples ornamented with frescoes and carvings in low relief. Although nobility and priests resided in these centers, the common people lived on farms surrounding the cities. The ceremonies that were performed in these centers were regulated by the Maya calendar, based on a sophisticated numerical system, knowledge of which was traditionally held by the priests. It is interesting to note that the Mayas were one of the few peoples in human history to hit on the concept of zero. The significance of this abstract concept is difficult to overestimate, for without it the simplest numerical computations are cumbersome and difficult. Our own use of zero is derived from a Hindu source, the latter people having made the invention some 1,200 to 1,500 years ago, considerably later than the same invention among the Mayas.

Like all the higher cultures of Indian America, Maya civilization was based on agriculture. The principal staple crop was corn, which was grown in fields cleared in the jungle. The soil of northern Yucatan is so thin, however, that the fields could not produce indefinitely, and new fields had to be cleared every few years in the forest. In addition to corn, beans and squash were important domesticated plants, and the food supply was supplemented by other products, such as chili peppers and papayas.

The ancient Maya cities were too large to be shown in their entirety in diorama form. For this reason, only a part of the

STUDIO PREVIEW

Mr. Elias Colunga (left), Mexican Consul in Chicago, inspected the diorama before it was installed in exhibition hall. Mr. Alfred Lee Rowell, Diorama-ist in the Department of Anthropology, who created the exhibit, is demonstrating how miniature tree is fitted into the landscape.

'FOURTH DOWN—SIX YARDS TO GO!'

—or something like that. In the back of the temple in the Chichen Itza diorama is depicted a hotly contested Maya ball game. The play is believed to have been rougher than football. Object of the game was to drive a rubber ball through a stone ring projecting from the wall of the ball court, using only the knees, thighs, and hips on the ball. A crowd of "fans" lines the stadium-like walls.

city of Chichen Itza is portrayed in the Maya diorama. One section of the diorama is taken up by a single temple—the *Casa Colorada*—with its associated features. The latter consist of a ball court and smaller secondary temple built on the far wall of the court. The *Casa Colorada* itself is a stone masonry structure in the typical Maya style of the period. The temple is built on a large pyramidal base, with a massive stairway rising from the ground level to the level of the temple. The base and the temple proper were both constructed of masonry, which was then carefully covered with plaster. Two distinctive features of the temple consist of a "flying facade" or "false front" built along the roof and a roof crest that rises behind the facade. Both roof crest and facade were decorated with distinctive carvings in low relief, which were then painted to bring out the qualities of the design elements.

In the diorama, two priests in full ceremonial dress are shown advancing to the top of the temple steps to greet a noble, who has just left his sedan chair and is climbing the steep stairway. The latter's attendants and bodyguard remain below.

In the ball court at the rear of the temple a game is in progress. Spectators line the walls to watch the two teams of men in their hotly contested ball play. The object of the game was to drive a rubber ball through a stone ring projecting from the wall of the court. Only the knees, thighs, and hips were used, it is said. The game must have been rough, although we do not know how frequently a score was made.

DOMESTIC LIFE PORTRAYED

The remainder of the diorama is devoted primarily to domestic life. At the right, a typical Maya house is shown. At one side of the house is a shed covering a group of beehives, while at the other side is a small raised vegetable garden, both characteristic Maya culture traits. In front of the house, a wandering trader has spread his wares—quetzal feathers, copper axes, cacao beans, and obsidian—before a small knot of interested onlookers. In the background, the corn fields extend into the distance. Toward the front and at one side is a woman drawing water from a *cenote*, or large natural well. Northern Yucatan has no running streams, and both the ancient and modern Mayas make use of *cenotes* to obtain water.

The successful completion of the Maya diorama is the end product of more than two years of patient and careful work. The diorama was built by Mr. Alfred Lee Rowell, Dioramist in the Department of Anthropology. In 1946, before commencing the actual construction, Mr. Rowell was sent by the Museum to Chichen Itza. Here he made sketches and took notes on the temple structure and all the features of the natural environment that appear in the diorama. On Mr. Rowell's return to the Museum, much additional research in the Museum's library on Maya archaeology was conducted by Mr. Rowell* before the form of the diorama was fully conceived. Architectural details of the temple and ball court were also kindly contributed by Mr. Karl Ruppert, a Maya specialist of the Division of Historical Research of the Carnegie Institution of Washington.

The form of the diorama was then discussed at length with the entire curatorial staff of the Department of Anthropology. Dr. Paul S. Martin, Chief Curator of the department, was among those who originally excavated and restored the major ruins at Chichen Itza, and his careful scrutiny of the plans eventuated in the final composition of the diorama.

Work was then commenced by Mr. Rowell. Bit by bit the model took shape. The temple restoration was cast by Mr. John Pletinckx, Ceramic Restorer in the Department of Anthropology. Other members of the department co-operated in the construction. The completed diorama forms a major attraction in the Hall of American Archaeology.

* And by Curator Spoehr, writer of this article.

NEW MEMBERS

The following persons became Museum Members between November 16 and December 15:

Associate Members

Eugene C. Fay, E. E. Hesse, A. Paul Holleb, Calmer L. Johnson, Louis E. Laflin III, Malcolm E. Shroyer, Mrs. C. D. Varel.

Annual Members

Joseph J. Abbell, Albert I. Appleton, George Barnes, Eskil I. Bjork, William G. Bock, John T. Browning, Guy T. Buswell, Martin F. Carroll, Serge Chermayeff, Miss Marion W. Cole, Sander W. Cole, Paul W. Cutler, F. S. Douglass, Dr. Thomas C. Douglass, Russell Fifer, Allan A. Foss, S. G. Geiger, J. M. Gerrard, David E. Goldich, Julian H. Hardy, Mrs. L. Martin Hardy, Fred A. Hertwig, Mrs. John A. Hurley, Paul B. N. Lind, Donald MacArthur, William F. McKee, David C. McPherson, John C. Meiszner, B. B. Melgaard, Mahlon D. Miller, Willard M. Miller, Albert A. Morey, P. K. O'Connor, Albert M. Olson, Alfred S. Pederson, John Ward Phillips, James C. Pirofalo, Frank P. Rodwick, Bernard G. Sang, Mrs. Arnold C. Schultz, Chester H. Schultz, A. T. Sears, Walter M. Sheldon, Jr., E. W. Stevens, Melvin S. York, Dr. Donald R. Young, John G. Zelezny.

Man's quest for vegetable food is pictured in a series of murals by Julius Moessel in Hall 25 (Food Plants and Their Products).

Last Call For Entries of Nature Photos

January 17 is the final day for the receipt of entries in the Fourth Chicago International Nature Photography Exhibition to be held at the Museum under the auspices of the Nature Camera Club of Chicago. Photographs submitted will go before the panel of judges on January 22. The exhibition will be held in Stanley Field Hall from February 1 to 28, inclusive. Screenings of colored slides will be presented on February 13 and 20.

'POTATO-TOMATOES'

By HUGH C. CUTLER
CURATOR OF ECONOMIC BOTANY

Tomatoes growing on potato vines were reported by several newspapers last summer and facetiously referred to as "topatoes" and "pomatoes." Most of the articles attributed the occurrence of the tomatoes to the influence, perhaps transmitted by bees, of near-by tomato plants or to the fact that the land had previously been planted to tomatoes.

Tomatoes and potatoes can be harvested from one plant, but the plant must be composed of the roots and part of the stem of a potato plant to which have been grafted the stem and leaves of a tomato plant. Tomato plants can be grafted on a great many different kinds of related rootstocks, including those of wild plants like nightshade. In the tropics where tomatoes are often susceptible to stem and root diseases, advantage has been taken of this fact and young tomato stems are sometimes grafted to the hardier stems and roots of native wild relatives of the tomato.

COULD ADD TOBACCO

By grafting tomato and tobacco stems to a potato rootstock, one could even harvest tomatoes, tobacco, and potatoes from the same plant. If adequate space were available, one could even add a piece of an eggplant and of a petunia. All of these plants are members of the nightshade family, or Solanaceae, examples of which are shown in Case 826 of Martin A. and Carrie Ryerson Hall (Hall 29—Plant Life).

But the plants featured in the newspaper accounts were not grafted. And because a potato is planted from a piece of the tuber or potato of the parents and has not been affected by the pollen that fell on the plant of last year, it cannot be part tomato for that reason.

There is, however, a simple explanation for these stories. The potato is a native of the Andes of South America, where it normally produces many fruits. But when some varieties are grown far from the equator in fields with longer summer days, the plants continue to produce tubers but the flowers do not always develop into fruits. Many gardeners who have grown potatoes for years have never seen a fruit on their potatoes.

FRUITS SLIGHTLY POISONOUS

Recently some new varieties of potato have been developed by plant breeders in the United States and some of these, especially a variety called Katahdin that is widely planted in New England, have functional flowers and frequently bear inedible, slightly poisonous fruits that resemble very young green tomatoes. These are the fruits seen by the reporters.

Even though they are a rarity to the agriculturist, to the botanist potato fruits have been familiar for a long time. Some

POTATO FRUITS AND FLOWERS

Early drawing from a book published in Europe shortly after the first shipments of potatoes arrived in that continent from South America.

of the earliest shipments of potatoes from South America to Europe were of kinds that flowered and fruited well even in that climate and the first drawings of the potato show its fruits very clearly.

JANUARY LECTURE TOURS, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Jan. 5—Pageant of Winter—Plants and Animals (*Jane Sharpe*).

Fri., Jan. 7—Your Winter Vacation—The Andes Countries. Illustrated introduction (movie) in Meeting Room (*June Buchwald*).

Wed., Jan. 12—Smokers and Chewers (*Marie Svoboda*).

Fri., Jan. 14—Guatemala. Illustrated introduction (movie) in Meeting Room (*Harriet Smith*).

Wed., Jan. 19—From Plait to Permanent—Global Hair Styles (*June Buchwald*).

Fri., Jan. 21—Animals of Legend and Fable. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Jan. 26—Designs in Wood—Tree Growths that Result in Beautiful Patterns (*Miriam Wood*).

Fri., Jan. 28—Birds and Their Homes. Illustrated introduction in Meeting Room (*Jane Sharpe*).

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

"Mr. Charles F. Millspaugh, Curator of the Department of Botany, was invited by Mr. Allison V. Armour, one of the Patrons of the Museum, to map out a cruise of the Antillean Islands calculated to best correlate the studies of the Curator in the Flora of Yucatan. The itinerary was made to include Bermuda; San Juan, Caguas, Ponce and Guanica, Porto Rico; St. Thomas, Culebras Islands, San Domingo, Jamaica, Santiago, Cayman Brac, Grand Cayman, Isle of Pines, Cozumel, Yucatan and the Alacran Shoals."

* * *

"Among the permanent improvements in and about the Museum . . . may be mentioned the construction of a second story to the Taxidermist's shop, 30 x 60 feet in area. The lower floor is now entirely devoted to storage of specimens considered too valuable to be placed in the Jefferson Avenue building."

* * *

"The annual budget approved by the executive committee provided the sum of $102,000 for the maintenance of the Museum for the fiscal year."

[During the year 1947, the cost of operating the Museum totaled more than $1,012,000.]

* * *

"The entry and cataloguing of the Bebb Herbarium having been completed—with the exception of the lower cryptogams—a summarized account of the specimens in the Department of Botany will doubtless be of considerable interest . . . to the botanical world.

[This early accession amounted to 70,772 specimens. The Museum Herbarium now includes more than 1,000,000 sheets.

HUNTING FOR SALAMANDERS IN THE APPALACHIANS

By CLIFFORD H. POPE
CURATOR OF AMPHIBIANS AND REPTILES

Zoologists working in large museums are in a dilemma: Only a big city can support such a museum and nowhere is animal life less abundant than in a large city and its environs. The "expedition" is the usual answer, but another way of resolving the dilemma lies in periodic visits to a biological station. At such a place one combines the facilities of the laboratory with the animal and plant life of the open country.

THE SLIMY SALAMANDER—IT STICKS LIKE FLYPAPER

The slimy salamander is frequently found in the Appalachian region. When caught, it "sweats" a mucus so sticky that dirt adheres to the captor's hands and can scarcely be scrubbed off. A glance at the collector often reveals whether this species is in his catch. Individual shown is 5.75 inches long. Photo by A. M. Winchester.

The University of Virginia maintains Mountain Lake Biological Station in the Appalachian Mountains west of Roanoke, Virginia. Situated near a beautiful lake at an altitude of nearly 4,000 feet, this station has an unsurpassed setting. The deep lake of clear water is the only one of its kind in the southeastern states. It was not formed by glacial action but through the natural damming of a valley by great blocks of clinch.

Still greater in interest are the unspoiled mountains surrounding the station, some of which are covered with virgin forests. Every summer about fourscore graduate students and professional biologists forgather at Mountain Lake Biological Station, many with their families. The students receive formal instruction while the biologists teach and carry on research, with seminars and lectures scheduled every week.

RICHEST SALAMANDER FAUNA

The southern Appalachian forests harbor the richest salamander fauna known, a fact that led me to spend much of the summer of 1948 at Mountain Lake.

At meetings in Chicago of the American Association for the Advancement of Science, I had met Dean Ivey F. Lewis of the University of Virginia, the former director of the Mountain Lake Biological Station. Dr. Lewis suggested that I plan to work at Mountain Lake. Thereupon, I wrote to Director Bruce D. Reynolds and it was through his courtesy that the arrangements were made.

Since I had never before worked at such a station, it was a pleasant surprise to find that one of its chief virtues is the almost infinite possibility of co-operative endeavor and exchange of information. For example, when I needed minute animals with which to feed hatchling salamanders only an inch in length, I was shown by fellow researchers two sources of food. Miss Lucile Walton, of George Washington High School, Danville, Virginia, explained how, at that season, aphids of various sizes could be found in the galls on witch-hazel leaves. Dr. Lillian C. Thomsen, of Mary Baldwin College, Staunton, Virginia, provided me with great numbers of fly larvae that she had found in muck at the base of an oak tree. The information and material supplied by these specialists were merely incidental to their own problems. This shows how knowledge unimportant to one zoologist may be of great value to a colleague.

Dr. A. M. Winchester, of John B. Stetson University, De Land, Florida, proved to be extremely expert at taking photographs of small animals of all kinds and even succeeded in getting a remarkable picture of a rattlesnake in the act of striking. This had to be done with an exposure of only one five-thousandths of a second. Miss Catherine M. Russell, of New York Medical School, made cultures from the mouths and venom of the rattlesnakes in an effort to determine the role bacteria play in snake poisoning. There is considerable difference of opinion among "authorities," some believing that infection invariably follows bites of venomous snakes, others that such infections are merely incidental and occasional.

HAPPY DAYS!—MANY RATTLERS

All this work with rattlesnakes was possible because the summer of 1948 proved to be an unusually good one for dangerous snakes. Two rattlesnakes and a copperhead were found at the station and many additional rattlers in its immediate vicinity. In fact, Salt Pond Mountain on which the station is located has long been notorious for its rattlesnake population, and the original inhabitants were surprised that the biologists would live in such a dangerous place.

Co-operation outside of the laboratory was just as profitable. Years of collecting in the Mountain Lake area enabled Dr. Paul R. Burch, of the State Teachers College at Radford, Virginia, to lead us to a rattlesnake den as well as to a dam under which the giant salamanders known as hellbenders could be found. In this country these grotesque creatures grow to be more than two feet long; the only other kind lives in eastern Asia and is much larger. Colonel Robert P. Carroll, of the Virginia Military Institute, did not hesitate to tell us where many rare and even undescribed species of salamander had been found by him and demonstrated the advantages in learning the complete fauna and flora of one area such as western Virginia. His approach is in sharp contrast to that of the specialist in the large museum who attempts to learn the world fauna of one group of animals and may yet be ignorant of the floral and faunal setting in which the animals live.

CELLINI AND THE SALAMANDER

As already mentioned, field studies of salamanders had led me to Mountain Lake. Because of a lizard-like shape, salamanders are constantly confused with lizards. Actually, these animals are amphibians and lack scales, whereas a lizard is a reptile and has scales. Like other amphibians, salamanders have a moist skin and live in damp places. Strangely enough, salamanders have always been known to folklore as creatures that live in fire. In his famous autobiography, Benvenuto Cellini, the Italian metal artist of the 16th century, tells how a salamander was forcibly impressed on his mind. His father saw one crawling on the family hearth and forthwith gave young Benvenuto a sharp slap on the cheek, not by way of punishment but simply to make him remember forever the strange, fire-loving creature. The poor salamander certainly had been driven by the heat of the flames from its retreat in one of the logs piled on the hearth.

In the southern Appalachians these "spring lizards" are so abundant that they frequently get into water pipes and turn up in basins and tubs. Occasionally someone who drinks directly from a pipe gets a salamander in his mouth. It is commonly believed that the aquatic kinds keep springs and wells clean and therefore should not be killed. Although this belief is groundless, some of the species are confined to cold, clear mountain water, which of course is always relatively clean.

Having studied the distribution and life histories of the various species found in western North Carolina and neighboring parts of South Carolina and Georgia, I was anxious to make similar investigations of

the kinds found in western Virginia. Although twenty years ago salamandering was more or less of a hit-or-miss proposition, it has today become scientific. Instead of going to the wildest place one can hear about, one now pores over physiographic and topographic maps for hours in an effort to work out the probabilities of distribution based on physiography, geography, and faunal and climatic conditions.

The rarer salamanders of the woodland group live in dark, damp forests at high elevation. Experience has shown that a few kinds are found in every such forest. A thorough knowledge of the distributions as far as known is a prerequisite to a study of the various types of maps, chiefly topographic ones. This perusal of the maps invariably brings to light many fascinating gaps in our knowledge of this or that species. Here is an area of the preferred type of forest from which no salamander has been recorded. Will this particular forest prove to be inhabited by a salamander known to occur somewhat farther north, or will it be in partial or total possession of one common to the south? Or perhaps its heavily blanketed floor conceals an entirely new species. It is, of course, the principles of animal ecology and geography involved that make the work valuable from a scientific point of view.

The kind of salamander investigation described here can no longer be carried on with specimens preserved in a museum. This is why the worker himself must go out and find the animals. As a matter of fact, some herpetologists still attempt to draw conclusions from "pickled" salamanders, but the cleverest student is apt to go astray. One of the chief reasons for this is the instability of color in salamanders. The markings may so completely disappear that identification becomes excessively difficult. A scaly animal like a snake or lizard that has lost its color is more easily named than a scaleless creature like an amphibian.

One of the most striking of the southeastern woodland salamanders was first found in 1902 by Dr. Franklin P. Sherman, who was then State Entomologist for North Carolina. He sent two specimens to Dr. C. S. Brimley, who forwarded them to the United States National Museum where they were stored as specimens of the common slimy salamander. Not until 1916 were they recognized by Dr. Emmett R. Dunn as belonging to an entirely new species, which was named *Plethodon yonahlossee* after the region in which it lives. Dr. Sherman had made a note to the effect that the two specimens when he found them had had red backs but the National Museum herpetologist, unconvinced, took no action; their backs had turned black long before he saw them. This case shows not only how unstable are salamander colors but also how hard it may be for a small animal to get a big name.

WYOMING QUARRIES YIELD SEAFARING NOTHOSAURS

By RAINER ZANGERL
CURATOR OF FOSSIL REPTILES

During middle Triassic time, some 187 million years ago, the geography of Western Europe was very different from what it is today. There were sea basins in which large quantities of limestone and shale became deposited. The shorelines of these sea basins were populated with a variety of animals, among them many invertebrates, several kinds of sharks, and a considerable variety of fishes with ganoid type scales, as in the living gar pikes. There were also many different kinds of reptiles, of which the most conspicuous and typical group were the nothosaurs.

Nothosaurs were seafaring creatures well adapted for swimming and feeding in the water. Most likely they never went ashore, or if they did, it was only for the purpose of laying their eggs or basking in the sun.

Until 1935, nothosaurs had been known from Central Europe only; not even a fragment had been identified from any deposits in the New World. During the summer of 1935, Don Allsen, a student at the University of Wyoming, discovered some bones embedded in pieces of hard limestone on a quarry dump near Goose Egg, Wyoming. The rock had been quarried for road gravel and was derived from a relatively thin band of hard, partially dolomitic limestone, the so-called Alcova limestone of Central Wyoming. This limestone bank belongs to a formation 1,200 feet thick that consists mostly of sand and siltstone, the so-called Chugwater Formation. The Alcova limestone is only about 20 feet thick, but it is very conspicuous wherever it crops out because it forms vertical cliffs that can be seen from great distances. Since all of the Chugwater Formation has furnished very scanty fossil materials, and some parts of it none whatever, the value of the discovery of a partial skeleton of a nothosaur from the Alcova limestone is very great indeed, both from the geological and the biological standpoint.

The first specimen was described by Dr. E. C. Case of the University of Michigan in 1936 as *Corosaurus alcovensis*. The specimen comprised the skull, a large part of the vertebral column, the shoulder girdle, and the front limb. The pelvic girdle and the rear limbs are missing.

It seemed desirable for several reasons to plan an expedition with the specific purpose of obtaining more materials from this formation. Such an expedition was organized by Chicago Natural History Museum last summer, with the result that about a dozen additional specimens, presumably of the same species, were obtained, besides a large number of isolated bones and a specimen of another reptile whose systematic position cannot be determined until it is prepared.

Securing specimens from a hard bank of limestone belongs to the more difficult paleontological field operations. In this case, it involved the peeling off of coarse-surfaced slabs, each of several inches' thickness, over areas up to 400 square feet, and from the surface of the formation to a depth of up to six feet. Removing this mass of hard rock by hand, that is, with no tools heavier than tool steel chisels, sledge hammers, and crow bars, requires a great amount of exceedingly hard physical labor. The skeletons are buried either inside the rock, in which case they cannot be detected except on the break surfaces of the slabs, or they lie on the bedding planes of the formation and thus are visible when the slab covering them is being removed.

The preparation for study of this material will require patience, time, and great skill on the part of the preparator, because the bones are much softer than the surrounding rock.

The members of the party were Mr. William D. Turnbull, preparator in the Museum, Mr. George Snyder, geology student at Dartmouth College, and the writer. Mr. Allan Jaeger, Mr. Ben Moss, and Mr. Stefan Kraszewsky each spent a month with the expedition.

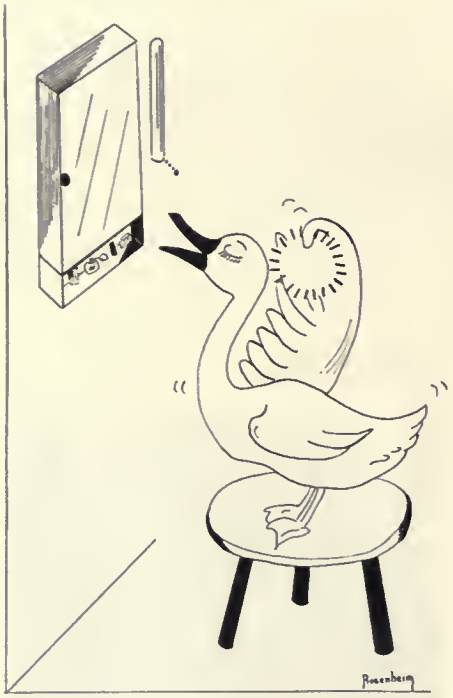
DIGGING SEA BOTTOM—IN WYOMING!

A paleontologist's life is not an easy one. Dr. Rainer Zangerl (left), Curator of Fossil Reptiles, and his expedition assistant, Mr. George Snyder, geology student from Dartmouth, really toil and sweat as they pry into the rocks for specimens of ancient marine creatures whose fossils indicate that nearly 200 million years ago an ocean covered the state now famous for cowboys and rodeos.

HOW BIRDS ANOINT THEIR FEATHERS

By AUSTIN L. RAND
CURATOR OF BIRDS

A BIRD'S plumage receives a great deal of care from the bird that wears it. The bill is the only implement for this grooming, and it is run through and along the feathers it can reach, helping clean them and making sure they lie in their proper place in the bird's dress. There are parts of



Cartoon by Emily Rosenheim

the plumage that the bird obviously can't reach, as that of the head, but ducks, at least, surmount this difficulty by rubbing their head against their body.

Many birds have oil glands (the only external glands that most birds have), a pair of glands just above and in front of the root of the tail, on the back. They contain an oily substance, and the usual explanation is that the secretions of those glands are used in dressing the feathers. Certainly birds that have oil glands seem to use them, nibbling at them as though to press out the oil, touching them with their bill and then rubbing the bill through the feathers, and rubbing the head against the oil gland.

The beautiful, soft, whitish bloom seen on some birds' feathers, such as the pale gray of a male marsh hawk and the filmy appearance of some herons' plumage, is caused by specialized feathers called "powder down." Sometimes this powder down is scattered through the plumage; sometimes it is in patches, such as the particularly conspicuous ones in the herons. The tips of the powder down are continually breaking off and sifting over the rest of the plumage, giving it the bloom that with handling quickly rubs off.

WALNUTS AS A COSMETIC

But birds sometimes rub foreign substances over their feathers—just why we don't know. Grackles have been known to use the acid juice of green walnuts in preening.

In Pennsylvania, starlings have been seen to come to walnut trees when the nuts were almost three-quarters grown, in June, and peck a hole in the sticky hull of a nut, then dip the bill into it, undoubtedly wetting the bill against the pulpy interior, and then thrust the bill into their plumage.

They did this from June to August, especially on hot summer days, but some birds continued this even during light rain. Some years before the above was recorded, when this sort of thing was less known, Edward Howe Forbush, noted ornithologist, cautiously used a similar record in his classical *Birds of Massachusetts and Other New England States*. He writes that his colleague, J. N. Baskett, says he saw a bluejay lift its wing and rub pungent walnut leaves repeatedly into the feathers beneath.

BEER AND MOTHBALLS

Since then such things have been recorded a number of times, including a catbird that anointed its feathers with a leaf and a grackle that found a mothball and, holding this in its bill, rubbed the underside of its spread wing and the part of the body under the wing. After several applications it dropped the mothball and preened its feathers; then again it picked up the mothball and treated the other wing as well as its belly.

Recent experiments with tame song sparrows have shown that they may use beer, orange juice, vinegar, and other things made available to them in dressing their plumage, and it appears that this may be correlated with a little-understood type of activity known as anting, in which live ants are placed on the feathers.

STAFF NOTES

Mr. Bryan Patterson, Curator of Fossil Mammals, has been on study leave at the American Museum of Natural History and at Yale and Harvard universities in connection with a publication on certain fossil mammals that is under preparation.... **Mr. Luis de la Torre,** mammalogist, returned from his expedition to Guatemala in the first week of December. He brought back a large collection of bats and other mammals.... **Dr. Hugh Cutler,** Curator of Economic Botany, lectured before the St. Louis Academy of Science and at the Missouri Botanical Garden on American food plants. He appeared over station KSD in a television program called "A Scientist Reports on South America." During the last part of the month he visited agricultural centers in Iowa, Minnesota, and South Dakota to study and discuss developments in plant science in the Midwest.... **Mr. Karl P. Schmidt,** Chief Curator of Zoology, will leave January 21 via British Commonwealth Pacific Airlines to attend the Seventh Pacific Science Congress at Auckland and Christchurch, New Zealand, in February.

GIFTS TO THE MUSEUM IN LAST MONTH

Following is a list of some of the principal gifts received during the last month:

Department of Anthropology:

From: Paul J. Warner, Chicago—2 brass bells, North and South Dakota.

Department of Botany:

From: Paul Humphreys, Whiting, Ind.—35 herbarium specimens, Norway; Dr. George D. Fuller, Chicago—25 herbarium specimens, California.

Department of Geology:

From: Dr. Carlos A. Friz, Chicago—a collection of 98 rocks and minerals.

Department of Zoology:

From: Maj. Howard T. Wright, San Antonio, Tex.—3,094 insects and their allies, Japan, and 2 insects, Korea; Dr. Orlando Park, Evanston, Ill.—384 American beetles; Dr. David Thompson, River Forest, Ill.—a gray fox skull, Illinois; Samuel A. Woods, Culver, Ind.—an American elk antler, Indiana; J. D. Romer, Hong Kong—14 frogs, lizards, and salamanders, China; Boardman Conover, Chicago—3 bird study skins; Capt. J. M. Ross, Chicago—500 shells, Solomon Islands; Mrs. Dorothy Foss, Chicago—a domestic cat skeleton and a juvenile domestic cat skull.

Division of Motion Pictures:

From: John W. Moyer, Chicago—1,200 feet of miscellaneous film on birds and animals.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; Eugene S. Richardson, Jr., Winnetka, Ill.; Gerhard Regnall, Stockholm, Sweden; and Dr. Julian A. Steyermark, Sarah B. Hodges and Edward L. Brewster, Dr. Wilfrid D. Hambly, and W. C. Adams, all of Chicago.

Annual 4-H Visit

Approximately 1,200 teen-age farm boys and girls from all parts of the United States and Canada, members of 4-H clubs who were in Chicago for the International Livestock Exposition, made their annual visit to the Museum. There were two groups, one on November 29 and one on December 2. The staff of the Raymond Foundation presented a special program for them in the James Simpson Theatre and served as guides on their tours of the exhibits.

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BULLETIN
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Chicago Natural History Museum

GALAPAGOS—

—stepping stone to 'Origin of Species'

(Darwin Anniversary Issue)

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

THIS MUSEUM'S EXPLORATIONS ON DARWIN'S TRAIL

The voyage of the *Beagle*, so famous as one of the sources of Charles Darwin's evolutionary thinking, was an old-fashioned exploratory voyage, to which Darwin was attached as collector. The collecting was pioneer work, and the importance of Darwin's specimens to modern studies is often that of the "type specimens" of remarkable new animals, both living and fossil. In fact, satisfactory renewed studies, especially in South America, may require collections from the very places where Darwin's types were collected.

Thus, in 1922–23, the late Dr. Wilfred H. Osgood, former Chief Curator of Zoology at this Museum, with Mr. Boardman Conover, Trustee and Research Associate, and Mr. Colin Campbell Sanborn, Curator of Mammals, reached many of the same areas in Chile as were studied by Darwin in 1834. Mr. Karl P. Schmidt, the present Chief Curator of Zoology, and Mr. Sanborn were on classic Darwinian ground in Uruguay in 1926, where, in fact, Mr. Sanborn collected the second and third known specimens of a little reed bird discovered by Darwin and long known as "Darwin's lost bird." The Cornelius Crane Pacific Expedition in 1928–29 visited the Galapagos Islands, especially associated with Darwin's vivid accounts of the giant tortoises and lizards and of the remarkable diversification of the land birds. The Galapagos were revisited by a Museum party on the Leon Mandel Galapagos Expedition of 1941.

The extraordinary abundance of fossil remains of most peculiar large mammals was first made known by Darwin, and the impressive sight of the great bones of ground sloths and toxodons must have been of as much importance as even the Galapagos animals in shaping Darwin's thinking. Thus, the Museum's great expeditions to South America for fossil vertebrates (the Marshall Field Expeditions of 1922–23 and 1926–27) were again on Darwin's trail.

MOOREA, MOST BEAUTIFUL OF SOUTH SEA ISLANDS

Photo by Karl P. Schmidt, Crane Pacific Expedition, 1929. A scene familiar to Darwin during the stay of the "Beagle" at Tahiti.

STANLEY FIELD BEGINS 41st YEAR AS PRESIDENT

The Museum's Board of Trustees held its Annual Meeting on January 24. Mr. Stanley Field was re-elected President and now begins his forty-first consecutive year in that office. All other officers who served in 1948 were re-elected. They are: Mr. Marshall Field, Chicago publisher, First Vice-President; Mr. Albert B. Dick, Jr., Second Vice-President; Mr. Samuel Insull, Jr., Third Vice-President; Colonel Clifford C. Gregg, Director and Secretary; Mr. Solomon A. Smith, Treasurer; and Mr. John R. Millar, Assistant Secretary. All have served for many successive years.

H.M.S. 'BEAGLE' IN STRAITS OF MAGELLAN

This picture of the ship upon which Darwin made his famous exploration is from his book "A Naturalist's Voyage Round the World," published by John Murray, of London, in 1890.

THIS MONTH'S COVER

This month we celebrate the 140th anniversary of Charles Darwin, who was born February 9, 1809. Darwin may well be referred to as the father of modern biology. A special Darwin exhibit, described elsewhere in this BULLETIN, is being featured in the Museum.

Our cover picture is a scene on the shore of Narborough Island in the Galapagos group, an area where the great naturalist made some of his most important observations during the famed voyage of the British naval vessel "Beagle," which provided Darwin with the opportunity for scientific exploration in 1832–36. The animals in the photograph are typical of the life of the Galapagos —a Galapagos sea lion; marine iguanas, a large lizard that grows to a length of about three feet; and, silhouetted against the sea, the remarkable flightless cormorants. The photograph was made by the Cornelius Crane Pacific Expedition (1928–29), which visited the Galapagos for scientific studies, during the course of a voyage girdling a large part of the globe, aboard the yacht "Illyria." Mr. Karl P. Schmidt, Chief Curator of Zoology, who was scientific leader of the expedition, says: "The wild coasts of Galapagos and the fearlessness shown by its animal life have the same charm today that they had in Darwin's time—on Narborough, at least, nature reigns supreme, unspoiled by man and his oft-times destructive 'civilization.'"

MUSEUM ACQUIRES 18 LETTERS WRITTEN BY CHARLES DARWIN

By KARL P. SCHMIDT
CHIEF CURATOR, DEPARTMENT OF ZOOLOGY

IN THE decade of the Civil War, Illinois was still too much engaged in that war's turmoil and in the rapid expansion of farming and urban communities to have impinged very much upon the intellectual revolution precipitated by the publication of Charles Darwin's *Origin of Species* in 1859. Darwin's one Illinois correspondent was an entomologist, largely self-trained, in the person of Benjamin D. Walsh, long resident in Rock Island. Mr. Walsh became the first State Entomologist of Illinois, but died in the year of his appointment; nevertheless he advanced government scientific activity.

BENJ. D. WALSH
An Illinois pioneer in natural science, recipient of Darwin letters recently presented to the Museum.

The eighteen letters written by Darwin to Walsh were received by the Library of Chicago Natural History Museum in 1948, as a gift, through Miss Thora M. Riley, of Washington, D.C., from Mrs. Emilie Conzelman Riley, the widow of the well-known American entomologist, Charles Valentine Riley. Dr. Riley had been a pupil and associate of Mr. Walsh, joining him in the enterprise of publishing the *American Entomologist*, and came to be a most influential personality in the rise of entomology as a science in the United States. It may properly be said that the chief contribution of Benjamin D. Walsh to American science lay in the training and inspiration received from him by Charles Valentine Riley.

Search in England has not enabled us thus far to find the letters from Walsh to Darwin to which the letters now before me are the replies. The whole correspondence would represent an element of some moment in the intellectual history of Illinois, where the chief contemporary focus of interest in natural history was the young Chicago Academy of Sciences, founded by the enthusiastic Robert Kennicott. The Darwin letters were made available to Francis Darwin and A. C. Seward for the *More Letters of Charles Darwin* (1903), in which work four of the eighteen letters were published, together with extracts from a letter from Walsh to Darwin that throw a good deal of light on the character and origin of the Anglo-American entomologist.

Walsh recounted that he had come to America at the age of thirty, with his rather literary Cambridge University education, possessed with the idea of living a wholly natural life, independent of the world and of humanity. He bought a tract of several hundred acres of land twenty miles from the nearest settlement, and with but one neighbor, and settled upon it to engage in farming. He was forced to give up this project after nearly dying of malaria, and twelve years of pioneer farming left him a thousand dollars the poorer. He invested his remaining savings in a row of two-story brick houses in Rock Island, and the rent from these enabled him to live comfortably with some three-fourths of his time to devote to an enthusiastic interest in entomology. He laments the fact that only through the practical aspects of entomology as a defense

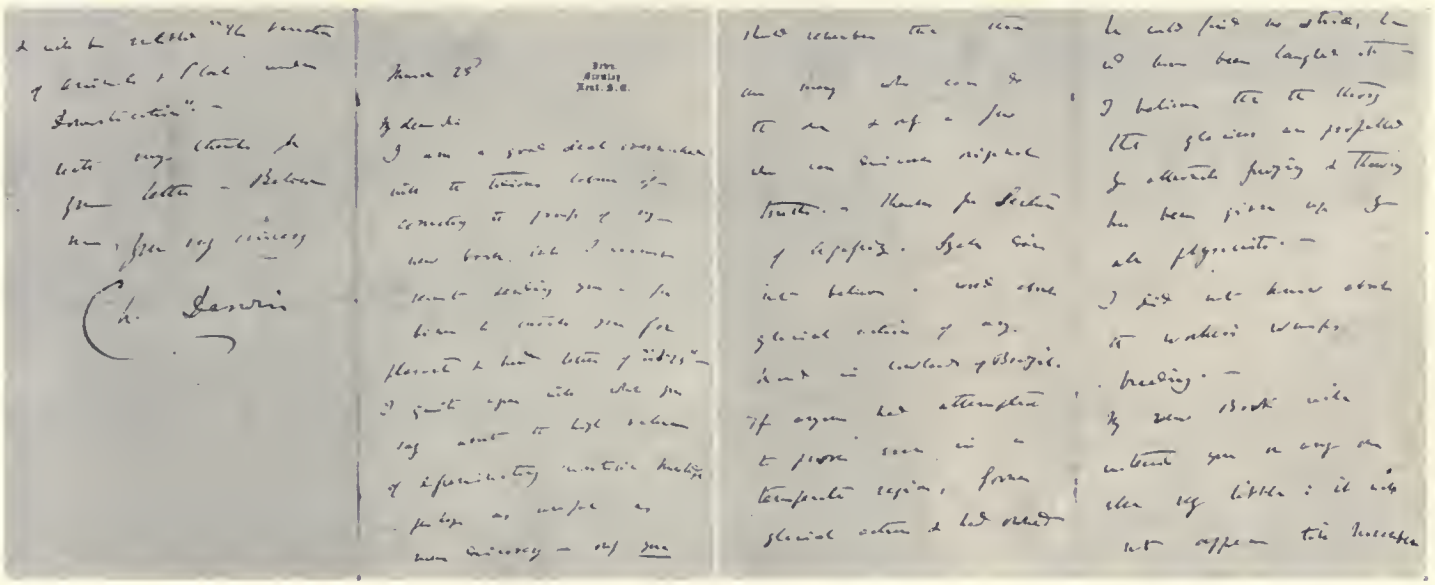
DARWIN
An unusual picture showing the naturalist as a young man instead of with the usually depicted heavy beard.

EXHIBITION OF DARWINIANA, FEBRUARY 9–MARCH 2

A special exhibit has been arranged for the occasion of the 140th anniversary of Darwin's birth—February 9, 1809. The exhibit, in Stanley Field Hall, will remain until March 2.

Two of Darwin's special interests are presented in Museum exhibition cases—"Artificial Selection" (as contrasted with "Natural Selection") and "Speciation in the Galapagos Islands," which has been the subject of much study, even in the past decade. These two cases will be moved temporarily to form the center of the special Darwin memorial exhibit. Two temporary side cases will be installed to show the Darwin letters and will also contain certain memorabilia that especially associate the

(*Continued on page 5, column 1*)



ONE OF THE 18 LETTERS WRITTEN BY CHARLES DARWIN TO BENJAMIN D. WALSH; NOW IN CHICAGO NATURAL HISTORY MUSEUM
In the accompanying article, Chief Curator of Zoology Karl P. Schmidt has deciphered Darwin's hurried, difficult-to-read scrawl.

of the farmer against the insect enemies of his crops could any support be gained for such studies in the United States.

RAILED AT SEVERE PRACTICALITY

"You cannot have," he writes to Darwin, "the remotest conception of the ideas of even our best-educated Americans as to the pursuit of science. I never yet met with a single one who could be brought to understand how or why a man should pursue science for its own pure and holy sake." Walsh would have been more at home in the Middle West a generation later, but astonishment at the pursuit of learning for its own sake is unhappily still to be found in our own day.

The eighteen Darwin letters replying to Walsh extend in time from October 21, 1864, to April 3, 1869. The series includes nine holograph letters and nine written entirely, or with the exception of a postscript, by an amanuensis. All are signed "Charles Darwin," "Ch. Darwin," or "C. Darwin." Some of the holograph letters begin in a readily legible hand, but as the letter progresses the script races into a hurried scrawl, often difficult to decipher, as may be seen in the letter illustrated, which I read as follows:

Down
Bromley
March 23 [1867] Kent, S.E.

My dear Sir

I am a good deal overworked with the tedious labour of correcting the proofs of my new book, but I cannot omit sending you a few lines to thank you for [your] pleasant and kind letter of Feb. 25th—I quite agree with what you say about the high value of disseminating scientific knowledge,—perhaps as useful as new discovery—only *you* should remember that there are many who can do the one & only a few who can discover original truths.—Thanks for Lecture of Agassiz. *Lyell* does not believe a word about glacial action of any kind in lowlands of Brazil. If anyone had attempted to prove [,] even in a temperate region, former glacial action [,] & had owned he could find no striae, he wd. have been laughed at.—I believe that the theory that glaciers are propelled by alternate freezing & thawing has been given up by all physicists.—

I did not know about the workers' wasps breeding.—

My new Book will interest you or anyone else very little: it will not appear until November & will be entitled "The Variation of Animals & Plants under Domestication."

With my thanks for your letter—Believe me, Yours very sincerely

CH. DARWIN

The letters, like those already familiar in the published collections, attest further to Darwin's modesty about his own work, to his generosity toward his colleagues and correspondents, and constantly to his continuing active and almost feverish interest in the *facts*, the "raw data," of biology. It is this latter quality above all others that makes Darwin so much a hero to generation after generation of museum biologists, who study and extend the classification of plants

SCELIDOTHERIUM—FIRST SPECIMEN WAS DISCOVERED BY DARWIN

When the Marshall Field Paleontological Expedition retraced Darwin's steps in Argentina it obtained this specimen of a giant sloth of the Pleistocene (a geological epoch that began 1,000,000 years ago). It is now exhibited, as shown above, just as it was found by the Expedition.

DARWIN'S 'LOST BIRD'

Darwin discovered this bird in Uruguay in 1832. It was not found again until Colin C. Sanborn, Curator of Mammals, collected two more on an expedition to Uruguay for Chicago Natural History Museum in 1926. The bird is called a reed-runner, a member of the tropical ovenbird family, and lives in swamps and marshes. The above picture is of a painting by the well-known artist, Walter A. Weber, made while he was on the Museum's staff.

GALAPAGOS TURTLE—A CREATURE STUDIED BY DARWIN

The above reproduction in plastic is exhibited in Albert W. Harris Hall.

and animals, living and fossil. Such studies, for some decades past, have all too often been depreciated by our experimentalist university colleagues. Happily, in the "New Systematics," and in the "New Natural History," for which the name *ecology* is gaining currency, there are healthy signs of *rapprochement* between the two groups. We may be hopeful that the theme of evolution, which so fertilizes every department of biology, may resolve much of the disharmony between university and museum biologists in the next generation.

EXHIBITION OF DARWINIANA

(*Continued from page 3*)

Museum with Darwin's South American explorations.

Outstanding in significance to zoologists among the items exhibited is a specimen of "Darwin's fox" and "Darwin's lost bird," both numbered among the Museum's rarest treasures. In *The Voyage of the "Beagle"* Darwin recounts the story of how he, while engaged in geological collecting, saw the fox and, having no other weapon at hand, crept up behind it and killed it with his geological hammer. Only five specimens of the bird and three of the fox are known to exist. The story of the "lost bird" will be found with its picture in this BULLETIN. The Museum's specimens of both of these creatures were collected on Museum expeditions, the bird by Mr. Colin C. Sanborn, Curator of Mammals, and the fox by the late Dr. Wilfred H. Osgood, former Chief Curator of Zoology.

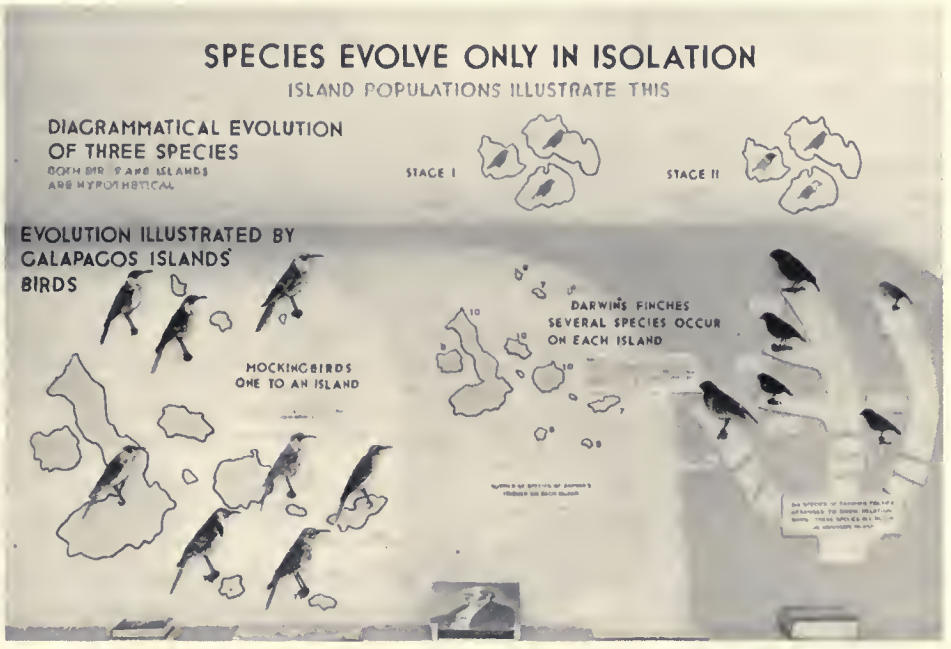
During 1948, Miss Thora M. Riley, of Washington, D.C., on behalf of her mother, Mrs. Charles V. Riley (Emilie Conzelman Riley), presented a notable collection of entomological books and journals to Chicago Natural History Museum from the entomological library of the late Charles Valentine Riley (1843–95). The books have been associated in the Museum Library by means of a special bookplate.

Later in the year a small parcel came to to the Museum from Miss Riley as an additional gift, and this proved to contain eighteen letters written by Charles Darwin to the late Benjamin D. Walsh of Rock Island, Illinois. Mr. Walsh had been mentor, friend, and associate of the much younger Riley at the beginning of the latter's career.

These gifts suitably commemorate Dr. Riley's interest in the founding of Chicago Natural History Museum, his interest in the state of Illinois, to which he came as a young immigrant from England in 1860, and especially in the city of Chicago, where he worked for some years as a journalist.

Nature Photo Contest winners on exhibition February 1 to 28, inclusive.

EXHIBITS EXPLAINING PHASES OF DARWIN THEORY


SPECIES EVOLVE ONLY IN ISOLATION
ISLAND POPULATIONS ILLUSTRATE THIS
DIAGRAMMATICAL EVOLUTION OF THREE SPECIES
STAGE I
STAGE II
EVOLUTION ILLUSTRATED BY GALAPAGOS ISLANDS' BIRDS
MOCKINGBIRDS ONE TO AN ISLAND
DARWIN'S FINCHES SEVERAL SPECIES OCCUR ON EACH ISLAND

Galapagos Islands birds were studied by the great naturalist in promulgating his theory of evolution. Here they are used to illustrate one phase of his theory, in one of the Museum's bird halls.

Darwin pointed out the similarity between natural and artificial selection. By breeding birds with desired characters, different strains or varieties are produced.

NEW MEMBERS

The following persons became Museum Members between December 16 and January 15:

Associate Members

Bertram W. Bennett, Mrs. D. C. Franche III, Mrs. John Morrow, Jr., Mrs. Henry L. Stein, Andrew L. Valentine.

Annual Members

Edmund B. Abbott, Charles C. Bradley, Frederick J. Bruckner, John B. Campbell, C. J. Cretors, Clinton O. Dicken, John K. Dorsey, Mrs. Robert J. Fischer, Clifford C. Fowler, Joseph S. Geiger, Miss Madeline Gelder, A. W. Hachmeister, Mrs. Dorothy Young Levin, H. William Melum, Aksel Nielsen, John W. Queen, B. E. Schonthal, Dr. Frederick J. Szymanski, D. C. Trager, Mrs. Vincent Yager, J. L. Young.

Scientist from Tasmania

Dr. Joseph Pearson, Director of the Museum of the Royal Society of Tasmania, was a recent visitor to this Museum, and conferred on scientific subjects with members of the staff of the Department of Zoology.

FEBRUARY LECTURE TOURS, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Feb. 2—Winter in the Wilderness—Animals of Our Western Parks (*Lorain Farmer*).

Fri., Feb. 4—Animal Pets of Other Countries. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Feb. 9—Circus Animals (*Jane Sharpe*).

Fri., Feb. 11—Nature's Medicine Cabinet—Medicinal Plants. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Feb. 16—Headline Exhibits in the Museum (*June Buchwald*).

Fri., Feb. 18—Natural Storage of Food—Seeds, Roots, and Other Plant Parts. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Feb. 23—Adjusting to Winter—How Animals and People Adapt to Winter Conditions (*Harriet Smith*).

Fri., Feb. 25—Animals in Action. Illustrated introduction in Meeting Room (*Jane Sharpe*).

EMPIRE BUILDERS OF THE ANDES

By DONALD COLLIER
CURATOR OF SOUTH AMERICAN ETHNOLOGY AND ARCHAEOLOGY

A recently installed exhibit in the Hall of American Archaeology (Hall B) deals with the Incas of Peru and their Andean empire. The Incas were originally a small but powerful tribe living in the valley of Cuzco in the mountains of southern Peru. Beginning about A.D. 1440, they embarked on one of the most remarkable campaigns of military and political expansion in the world's history. Thirty years later, the empire extended from Quito on the north to central Chile on the south, a distance of 3,000 miles. The empire fell to the Spaniards in 1532.

A part of the new exhibit is devoted to maps showing the stages of territorial growth of the Inca empire and the Inca highway system, which made possible the control and administration of such a vast area. Included are charts and drawings explaining the Inca governmental hierarchy and illustrating such engineering accomplishments as terrace and irrigation systems, suspension bridges, and government buildings that were the products of the Incas' ability for organizing the productive efforts of large groups of people. It was this genius for planning and organization rather than technological superiority over the conquered peoples that enabled the Incas to create and maintain their empire.

In the remainder of the exhibit are shown typical examples of Inca tools, weapons, utensils, and ornaments.

This new exhibit complements the previously installed diorama of an Inca village of A.D. 1450, shortly after the Inca expansion was well under way, in which are shown the domestic and agricultural activities of the people, and examples of architecture and public works.

The new exhibit was designed by Mr. Gustaf Dalstrom, artist in the Department of Anthropology, and the writer.

STAFF NOTES

Mr. Julius Friesser, Staff Taxidermist, has retired from the service of the Museum after nearly 44 years of service. He joined the staff in 1905. Mr. Friesser was born in Marburg, Austria. His interest was first

JULIUS FRIESSER AT WORK

aroused in collecting zoological specimens as a schoolboy. At the age of 19, in 1892, Mr. Friesser came to Chicago as a commercial taxidermist. In 1902 he made a collecting trip to Mexico for the Museum, which led to his joining the staff. Among the great number of individual mounts of large mammals and of habitat groups for which Mr. Friesser was responsible (above 200), he thinks of the Thompson's gazelle, the red-fronted gazelle, the young bull moose in the Alaska moose group, and the noble individual bull bison as representing his finest work. Mr. Friesser traveled to the Olympic Mountains for the materials and specimens of the elk group; to Alaska for the moose group; to British Columbia for Rocky Mountain goats; and to Guadalupe Island for sea elephants. . . . **Mr. Bryan Patterson,** Curator of Fossil Mammals, made a study trip to Carnegie Museum, Pittsburgh, to compare fossil mammal specimens from the Oligocene of Texas. . . . **Mr. Robert K. Wyant,** Curator of Economic Geology, spent a week at Joplin, Missouri, examining the field relationships and distribution of chert in lead and zinc mining areas. . . . **Dr. Theodore Just,** Chief Curator of Botany, was appointed chairman of the Membership Committee of the Society for the Study of Evolution and elected a member of the editorial board of *Evolution*, official journal. . . . On January 18, **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, was Biology Day guest speaker at William Jewell College, Liberty, Missouri. He addressed the student body on "Missouri Plant Life" and the biological fraternity's annual banquet on "Exploring for Plants in Guatemala.". . . **Mrs. Eunice Gemmill** has been promoted from Assistant Librarian to Associate Librarian. **Miss Louise Boynton,** who will continue her duties as secretary of the Library, has been appointed Assistant Librarian. . . . **Mr. Melvin A. Traylor, Jr.,** for some years an Associate in the Division of Birds, has been appointed Research Associate. . . . **Mr. George Langford** has been promoted from Assistant to Assistant Curator of Fossil Plants. . . . **Mr. George Woodward,** of the guard force, has been promoted to Senior Sergeant, and **Mr. David Dunsmuir** and **Mr. Truman Bentley** have been appointed Sergeants.

SUPPOSEDLY EXTINCT BIRDS REPORTED ALIVE

Naturalists in New Zealand have recently captured, photographed, and released two living specimens of a species of bird that has been considered extinct for fifty years, according to the *Illustrated London News* for December 11, 1948. It is a rail or gallinule, known to the Maoris as *Takahe* and to science as *Notornis hockstetteri*. It is flightless, about the size of a domestic fowl, generally blue with a greenish back, a heavy red bill, and a shield on its forehead like that of a coot, to which it is rather closely related.

Between 1849 and 1898, four specimens were taken and found their way into museum collections. Since then, nothing has been heard of the *Takahe* until last November when the above observations were made.

Recent news of another supposedly extinct species, the Eskimo curlew, is contained in the *Wilson Bulletin* for December, 1948. The Eskimo curlew once migrated northward through the Mississippi Valley in great numbers on its way to its breeding grounds on the Arctic barrens. There are three Chicago region records for the period 1872–80. Its return flight was along our Atlantic coast and southward to its wintering grounds on the pampas from the Argentine to Chile. The immense numbers killed

by market gunners in the latter part of the last century are supposed to be responsible for its virtual disappearance. Textbooks date the last specimens taken as 1915 in the United States, 1925 in Argentina. Since then there have been occasional sight records of a "small curlew," possibly the Eskimo curlew, but the close resemblance of the Eskimo curlew to the larger, more common Hudsonian curlew makes sight records uncertain. Now we have a record of one of a pair of birds killed in Newfoundland-Labrador, in 1932, indicating that the species is perhaps still extant. Since there is no shore-bird shooting in the United States and Canada, we may entertain hope that the Eskimo curlew may become abundant again.

—A. L. RAND

TWELVE EXPEDITIONS SLATED IN 1949

Chicago Natural History Museum will have twelve expeditions in the field during 1949—four in foreign countries and the others in various parts of the United States. The expeditions are as follows:

Cuban Botanical Expedition, which left in January, conducted by Dr. B. E. Dahlgren, Curator Emeritus of Botany, assisted by Dr. Hugh C. Cutler, Curator of Economic Botany.

Mexican (Sonora) Archaeological Expedition, which left in January, conducted by Mr. Donald Lehmer, holder of Museum fellowship from the University of Chicago.

Middle Central American Botanical Expedition, begun in 1948 and continuing this year, conducted by Dr. Paul C. Standley, Curator of the Herbarium.

Colombian Zoological Expedition, begun in 1948 and continuing this year, conducted by Mr. Philip Hershkovitz, Assistant Curator of Mammals.

Gulf States Botanical Expedition, begun in 1948 and continuing this year, conducted by Dr. Francis Drouet, Curator of Cryptogamic Botany.

Eastern States Botanical Field Trip, March, to be conducted by Dr. Julian A. Steyermark, Associate Curator of the Herbarium.

Southwestern Paleontological Expedition, May, June, and July, to be conducted by Dr. Robert H. Denison, Curator of Fossil Fishes.

Southwest Archaeological Expedition (16th season), to be conducted by Dr. Paul S. Martin, Chief Curator of Anthropology.

Eastern States Invertebrate Paleontological Expedition: First Section, June and July, under the leadership of Mr. Eugene S. Richardson, Jr., Curator of Fossil Invertebrates; Second Section, August and September, under the leadership of Dr. Sharat K. Roy, Chief Curator of Geology, accompanied by Mr. Henry Horback, Preparator.

Southeastern States Zoological Field Trip, June, July, and August, to be conducted by Mr. Clifford H. Pope, Curator of Amphibians and Reptiles.

Southeastern States Zoological Field Trip, August and September, to be conducted by Mr. Henry S. Dybas, Assistant Curator of Insects.

New York State Botanical Field Trip, September, to be conducted by Dr. Hugh C. Cutler, Curator of Economic Botany.

1948 Attendance 1,134,643

For the 22nd successive year, attendance at the Museum exceeded a million in 1948. The total number of visitors was 1,134,643.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The attendance for the year ending September 30, 1899, was 223,304.

* * *

"Under appointment as Honorary Special Agent of the Department of Mines and Metallurgy of the United States Commission to the Paris Exposition of 1900, Assistant Curator Henry W. Nichols spent about six weeks during the early summer in visiting the zinc and lead mining regions of New Jersey, Pennsylvania, Virginia, . . . About 300 specimens were thus collected, besides many choice specimens of the minerals which accompany the ores. After being exhibited at the Paris Exposition, the collection so obtained will become the property of the Museum. . . ."

* * *

One of the groups executed and installed in the Field Columbian Museum building by Carl Akeley. This group of striped hyenas may now be seen in Carl E. Akeley Hall (Hall 22).

* * *

"The growth of the collections [herbarium] has been so large and the character so excellent that this section of the Department of Botany now takes high rank as the largest herbarium in the Central United States, while the methods of installation and recording of specimens establish its usefulness. Over 5,000 plants have been mounted, poisoned, and installed in the cases, and over 2,000 identified, classified, and prepared for publication."

[In 1948 the number of specimens in the Herbarium exceeded 1,250,000.]

NATURE PHOTOS ON EXHIBITION FEB. 1—28

Beginning February 1 and continuing through February 28, the Museum will be the scene of the Fourth Chicago International Nature Photography Exhibition, under the auspices of the Nature Camera Club of Chicago. The accepted photographs, numbering several hundred black-and-white prints and color transparencies, will be displayed in Stanley Field Hall. These were selected by the judges as the best from more than 2,000 pictures received from many parts of the United States and a number of foreign countries. In order to provide a better view of the small color pictures, there will be two showings in which they will be projected on the screen in the James Simpson Theatre, on the Sunday afternoons of February 13 and 20 at 3 o'clock.

In each of the two divisions of the exhibition—prints and color transparencies—there are three classifications of pictures: *Animal Life*, *Plant Life*, and *General*. The general section includes scenery, geological subjects, clouds, and other nature manifestations outside the two specific classifications. Silver medals have been awarded the prize winners, and ribbons and other awards were made in each classification of each division. The judges were: Dr. Alexander Spoehr, the Museum's Curator of Oceanic Ethnology; Mr. Eugene S. Richardson, Jr., Curator of Fossil Invertebrates; Mr. G. E. Dahlby, photographer; Mr. Ralph Graham, Assistant Director, Chicago Zoological Park; and Mr. J. Philip Wahlman, photographer and associate of the American Photographic Society.

The names of the winners will be inscribed on the Myrtle R. Walgreen bronze plaque. Special awards and publication of pictures will be through the Photographic Society of America and various photographic magazines. An illustrated catalogue of the exhibit, to be available early in March, will be published by the Nature Camera Club of Chicago. A list of the winners and reproductions of some of their entries will be a feature of the March BULLETIN.

Mammals of Illinois are exhibited in four cases in Hall 13.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

BIRDS OVER AMERICA. By Roger Tory Peterson. Dodd, Mead and Co., 1948. 342 pages, illustrated with 105 photographs by the author. Price $6.

Griscom and Peterson would vie with each other for the position of patron saint of those bird-minded ones who follow "the lure of the list." Griscom is the "virtuoso of field identification" and Peterson's guides are the authorities in playing the game. It's a fascinating pastime this, finding and naming and listing birds.

It has, in part, taken the place of hunting birds with a gun. Teen-age boys, men, and women, too, follow the sport, but comparatively few teen-age girls. Its popularity is attested by an enrollment of more than 400,000 in junior Audubon Clubs in one school year, and audiences 1,600 strong have thronged to hear lectures about birds.

The energy of these bird listers is almost incredible. Peterson writes of 22 hours in the field in a day in May in the Boston area, when they ransacked every likely bog, thicket, wood, pond, and bit of beach for a grand total of 148 species seen or heard and checked on their list, an all-time record for Massachusetts. But it's interesting to read that Peterson sometimes makes his early morning list from his bed, and one such list compared favorably with that of his more energetic companions who went afield before breakfast.

In winter there's a big day at Christmas time for the "Christmas census," when in the Bronx at least there is an additional rule: a 15-mile limit on distance. The season's list is something else, with 317 birds recorded by Griscom in Massachusetts. The year list for the United States is held by Cummings with 752, while Griscom has a world "life-list" of 2,500. With modern transport and a global outlook one wonders just how large a score a world traveler could chalk up by touring Europe, Asia, Africa, Australia, and the Americas. A system of handicaps would have to be worked out.

His heart seems to be in the northeastern states, but Peterson has traveled widely in other parts of the United States, too, in search of subjects for his paintings and material for his *Bird Guides*. In *Birds Over America* he takes the reader with him on field trips off Cape Cod, in Central Park, into an abandoned attic in the Bronx for barn owls, to Hawk Mountain and Cape May for hawk migrations, on the Santee for ivory-billed woodpeckers, to Florida for bald eagles, to Texas for whooping cranes, and to the Southwest and California, where an off-shore trip yields albatross and salima gulls. When the pace slows down somewhat, we pause to consider distribution and ecology, falconry and glimpses of its history and its renaissance, and the study of populations and numbers of birds; and we briefly meet museum curators, businessmen, policemen, sailors, and wilderness residents, with asides into the history of scientific theory and fact.

A strong thread of conservation, linked to ecology, runs through the book, and conservation and ecology go together. When the marshes are drained, the ducks disappear; when the forests are cut down, the woodland birds go with it. But it's not all loss. The fields and the built-up land are occupied by other birds that could not live in the forest, and garbage dumps and sewer outlets, unsightly and nauseating to human beings, seem especially attractive to some birds. And possibly some birds increase or decrease without regard to man's activities, or even in spite of them.

It is interesting to see pointed out the illogical sentimentalism that considers it "wrong" to kill certain birds but "right" to kill some others at certain times. A game warden, who undoubtedly enjoys shooting ducks in season, considers it a shame for a collector with proper permits to kill a song bird, a point of view widely shared but without basis in reason.

Peterson has laid aside his brush here, and the bird portraits are those recorded by his camera, a series of charming pictures. The whole is excellent escapist literature, a chance to enjoy vicariously the thrills of birding with an expert.

A. L. RAND
Curator of Birds

Technical Publications Issued

The following technical publications were recently issued by Chicago Natural History Museum:

Zoological Series, Vol. XIII, Part I, No. 3. *Catalogue of Birds of the Americas.* By Charles E. Hellmayr and Boardman Conover. December 16, 1948. 384 pages.

Fieldiana: Anthropology, Vol. 36, No. 4. *Prehistoric Art of the Aleutian Islands.* By George I. Quimby. December 30, 1948. 16 pages, 7 text figures. $0.30.

Fieldiana: Zoology, Vol. 31, No. 23. *Three New Land Shells from Peru.* By Fritz Haas. December 30, 1948. 6 pages, 3 text figures. $0.15.

Fieldiana: Zoology, Vol. 31, No. 24. *New Birds from Peru and Ecuador.* By Melvin A. Traylor, Jr. December 30, 1948. 6 pages. $0.10.

Fieldiana: Zoology, Vol. 31, No. 25. *Five New Birds from the Philippines.* By A. L. Rand. December 30, 1948. 6 pages. $0.10.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Miss Esther M. Sogge, Oak Park, Ill.—11 archaeological specimens, New Mexico.

Department of Botany:

From: Dr. José Antonio Echeverria C., San José, Costa Rica—97 herbarium specimens, Costa Rica; Museo Nacional, San José, Costa Rica—16 herbarium specimens, Costa Rica; Captain H. T. Dalmat, U. S. Army—13 herbarium specimens, Guatemala; Dr. George D. Fuller, Chicago—33 herbarium specimens, Illinois.

Department of Geology:

From: George Langford, Chicago—82 paleobotanical specimens, Illinois; Stuart H. Perry, Adrian, Mich.—5 meteorite specimens; Edwards N. Richardson, Winnetka, Ill.—camp equipment; University of Chicago —10 fossil teeth, Texas.

Department of Zoology:

From: Museum of Comparative Zoology, Cambridge, Mass.—47 dryopoid beetles of 28 species (of which 10 are paratypes), United States and West Indies; Rev. Father A. Buch, Ningpo, China—652 insects, China; Chicago Zoological Society, Brookfield, Ill.—a slow loris and 44 birds; Lincoln Park Zoo, Chicago—3 lizards and 5 frogs, Dutch West Indies and Panama; Dr. Elliott C. Williams, Crawfordsville, Ind.—3 frogs and 2 lizards, Panama and Canal Zone; Henry S. Dybas, Chicago—81 click beetles, United States; Glen C. Sanderson, Columbia, Missouri—3 snake specimens, Okinawa Island; A. and B. Patterson, Chicago Heights, Ill.—143 insects and allies, Illinois; Harry Hoogstraal, Chicago—758 insects and allies, New Guinea and Philippine Islands; Boardman Conover, Chicago—52 mammals and 41 birds, India.

Library:

From: American Philosophical Society, Philadelphia; Hermano Leon, Havana, Cuba.

Museum Co-operation With Schools

The facilities of the Museum are offered for the use of the faculties and students of all educational institutions. Among those that have regular organized programs correlating their curricula with or otherwise receiving co-operation from the Museum are: Chicago public schools, parochial schools of Cook County, Cook County public schools, various private schools in Chicago and suburbs, the University of Chicago, Northwestern University, the School of the Art Institute of Chicago, and Antioch College of Yellow Springs, Ohio.

The Department of Geology has on exhibition in Hall 34 and Stanley Field Hall a notable collection of amber, including specimens in which insects and other foreign matter are imprisoned.

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

TELEPHONE: WABASH 2-9410

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SHARAT K. ROY.....*Chief Curator of Geology*
KARL P. SCHMIDT.....*Chief Curator of Zoology*

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Members are requested to inform the Museum promptly of changes of address.

TO A TUATARA ALIVE IN MY HAND

Thou reptile, ancient in this land
For ages ere the Maoris came,
You well deserve your zoologic fame,
And here, in all the world, could take your stand

Resisting Evolution's mighty flow,
While mammals rose and had their day
Where once the reptiles ev'rywhere held sway:
How, but for you, should we the Mesozoic know?

Saved from those mammals, all too predatory,
Retreating still, you now have found
Alone with friendly birds, beneath the ground,
And at long last, an off-shore island sanctuary.

Oh Tuatara, you may yet survive in peace
When all man's glories and his struggles cease.

Karewa Island, Bay of Plenty
New Zealand, January 28, 1949

KARL P. SCHMIDT
Chief Curator of Zoology

(Mr. Schmidt has been on a flying trip to New Zealand and Hawaii to attend the Seventh Pacific Science Congress and to collect zoological specimens.)

Transfer of Hall Name

By action of the Board of Trustees the name "Joseph Nash Field Hall," applied to Hall A, Ethnology of Melanesia, since 1914, has been transferred to Hall 10, Indian Tribes of the Northwest Coast and Eskimos.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

WILD FLOWER GUIDE. Northeastern and Midland United States. By Edgar T. Wherry. Illustrated by Tabea Hofmann. xv+202 pp., 48 plates in color, 58 plates in black-and-white, map, 4 figures. Doubleday & Co., Inc. $3.

This handy, pocket-size guide, attractively printed and profusely illustrated, should have an immediate and strong appeal to all flower lovers. In addition, the reader soon discovers how much of the natural charm and beauty of our native and introduced wild flowers was captured by the author and how well he transmitted his extensive knowledge of their soil and other requirements for the benefit of those who wish to grow them.

Technical details are held at a minimum and set forth, for the most part, in short introductory chapters or elsewhere in the book. Most useful will be the glossary of descriptive botanical terms employed, comments regarding classification, the common and scientific names applied, principles of wild-flower conservation, and wild-flower literature. Actually, each of the more than 500 species included is given its common and scientific names, and its features, range, habitat, culture, and notes are succinctly stated. Easy keys and lists of flowers by color aid in their quick identification.

The characterizations of the major groups contain discussions of the main evolutionary lines known and adopted by the author in arranging the sequence of the families represented. Thus the section dealing with the free-petal dicots begins with the water-lily family (Nymphaeaceae) rather than those customarily found in manuals.

Confident that many flower lovers will not be content with knowing the names of wild flowers, the author appended an admirable summary of plant ecology, the field concerned with the "place of the plant in nature's scheme of things." Sound ecological knowledge is prerequisite to successful conservation of wild flowers "in the midst of the drabness of the civilized landscape."

THEODOR JUST
Chief Curator of Botany

Technical Publication Issued

The following technical publication was issued by Chicago Natural History Museum last month:

Fieldiana: Zoology, Vol. 25. *Mosses of Guatemala.* By Edwin R. Bartram. Jan. 31, 1949. 442 pages, 190 text figures.

LECTURE TOURS IN MARCH DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Mar. 2—Strange Ancient Customs (*June Buchwald*).

Fri., Mar. 4—The Land of Chicago—A Geological and Ecological Story. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Mar. 9—Edible Wild Plants in the Chicago Region (*Marie Svoboda*).

Fri., Mar. 11—Braggarts and "Apple-Polishers." Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Mar. 16—Animals of Illinois (*Jane Sharpe*).

Fri., Mar. 18—Museums, Old and New—Purpose of Museums and How They Have Developed. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Mar. 23—Jewelry—Precious and "Costume" (*Harriet Smith*).

Fri., Mar. 25—The Gift of Green—The Story of the Plant Kingdom. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Mar. 30—Wisdom in the Wild—Special Habits of Animals (*Lorain Farmer*).

THIS MONTH'S COVER

The picture of three young koalas on this month's cover is one of the honorable mention winners in the Fourth Chicago International Nature Photography Exhibition held by the Nature Camera Club of Chicago in the Museum during February. The photographer is Mr. G. Grant Thomson, of Brisbane, Queensland, Australia. These animals are marsupials or pouched mammals like so many other Australian animals and are in the same general group with kangaroos and our Virginia opossum. Koalas are about two feet long and have but a rudimentary tail. They spend their lives in trees and are very slow-moving and sluggish for an arboreal animal. They are very fastidious about their food, living exclusively on the leaves of eucalyptus, and only certain species of eucalyptus at that. These leaves have a high oil content—koalas never drink water.

SOME FACTS AND FANCIES ABOUT THE MIGRATION OF BIRDS

By EMMET R. BLAKE
ASSOCIATE CURATOR OF BIRDS

BIRD migration is of almost universal interest to observant persons throughout the temperate areas of the world. In the United States the study of birds has attracted a host of amateur devotees from all walks of life, a fact that is reflected by the numerous popular bird guides available today and by the increasing number of local bird study clubs formed in recent decades. Many clubs are most active during the migration seasons, when organized "bird hikes" become, for a time, the chief interest of countless thousands of the faithful who gladly undergo rigorous excursions afield to observe birds in migration.

Twice each year during the spring and fall months, the Museum's ornithologists become conscious of a marked increase in the popular interest in birds. From long experience they have come to expect, usually in February, a telephone call in which an excited voice announces the arrival of the "first" robin, bluebird, or other migrant in the Chicago area. With the season's advance these calls become more frequent as enthusiastic local observers report on the progress of migration or discuss problems of identification. Similarly, in the fall, there is a resurgence of public interest in birds that is correlated with their annual southward flight.

The widespread appeal of bird migration to the human imagination is not entirely a recent development. On the contrary, the seasonal movement of birds between their summer breeding grounds and winter homes probably attracted the cave man's attention during the Pleistocene and certainly has been the subject of comment throughout much of recorded history.

BIBLE REFERENCES

Numerous references to bird migration are found in the Bible, that of Job (XXXIX, 26) being perhaps the first of the general references. One of the earliest specific migration records (Exodus, XVI, 13) concerns the sudden appearance of quails upon which the Israelites fed in the desert of Sinai, a date estimated by competent authorities as April, 1580 B.C. The biblical account indicates that approximately nine million birds may have been gathered within thirty-six hours on that occasion, a figure that will not greatly surprise present-day enthusiasts who attempt to count migratory birds at the peak of a "wave" in early spring.

Ancient man advanced various theories to account for the sudden appearance and equally sudden disappearance of migratory birds that came to his attention. Having no knowledge of nocturnal migration, many held that swallows and various other species that normally congregate near marshes before their fall migration merely hibernate in the mud or change into frogs each winter. Early literature contains many accounts by glib eyewitnesses in support of this theory. Other scholars of the time believed in direct transmutation, arguing that birds change from one to another with the seasons, and thus explained the arrival and departure of various species within a period of hours.

A more ingenious theory, but one less generally accepted, was that which fixed the moon as the wintering quarters of migratory birds. The details of this remarkable journey were set forth in a pamphlet published in 1703 by one known to history only as "A Person of Learning and Piety." According to this anonymous raconteur, migratory birds require two months for the lunar journey and, once beyond earthly distractions, manage to sleep while in full flight. Until relatively recent times no one imagined that small birds are capable of extended flight, and so was born the general belief that the smaller species are transported on the backs of the larger, like Aeneas' father! Occasionally, even today, this theory is accepted by the credulous.

ROUTES HAVE BEEN TRACED

The phenomenon of bird migration has undergone close scientific scrutiny in recent decades and much of its mystery has disappeared. Largely through the "banding" activities of the Fish and Wildlife Service, supplemented by the co-operation of amateur observers throughout the country, the routes followed by most North American species in migrating between their summer and winter homes are now well known. With many, even the extreme and average dates of arrival and departure in various communities are now a matter of established record.

An exhibit recently installed in Hall 21 illustrates graphically four of the principal types of migration found among North American birds. The robin's seasonal movements are an example of partial migration duplicated by many other species that breed principally in the north and winter in the southern states. With these, the summer and winter ranges overlap somewhat. A few individuals sometimes remain in the breeding area throughout the year, and these account for many observations reported as "first" arrivals.

AIR ROUTES AND SCHEDULES—FOR BIRDS
Exhibit illustrating graphically the principal known facts about migration

Redstarts illustrate a second type of migration pattern (complete migration) that is also very common among North American birds. Most species of this category breed in the far north and journey southward annually to the West Indies, Mexico, or beyond. Golden plovers and Arctic terns, also featured in the exhibit, are even better examples of birds that perform complete migrations requiring journeys of several thousand miles twice each year. The latter is perhaps the champion long-range migrant of all, for it breeds principally within the Arctic Circle and must travel as much as 10,000 miles to reach its winter home in the Antarctic. Also included in the exhibit are maps illustrating the principal waterfowl "flyways" of North America and charts

(*Continued on page 5, column 2*)

SCIENCE AND TRAVEL LECTURES, SATURDAY AFTERNOONS, MARCH AND APRIL

The annual Spring Course of free illustrated lectures for adults will be given in the James Simpson Theatre of the Museum on Saturday afternoons during March and April. There are nine lectures, and all begin at 2:30 P.M.

Color motion pictures will accompany all but one of the lectures. Limited accommodations make it necessary to restrict the lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

March 5—Alaskan Holiday

C. J. Albrecht

Mr. Albrecht will tell the story of the Mr. and Mrs. William S. Street Zoological Expedition to the Alaska peninsula to collect a new group of Kodiak bears for Chicago Natural History Museum. The films, made by Mr. Albrecht, who was formerly a member of the Museum staff, show the scenery en route to Mother Goose Lake and such animals in their native habitats as polar bears, walruses, fur seals, moose, caribou, beavers, otters, and myriads of birds. Kodiak bears, the world's biggest species, were photographed, at close range, fishing, and there is a sequence showing a salmon run.

March 12—Brown Peoples of the Blue Pacific

Robert E. Ritzenthaler

This is the story, in colorful films and narrative, of an expedition to the Micronesian area of the South Pacific. Features of the films are the people of Yap, with their famous stone money, and village life in the islands of Palau, scene of much action in the recent war. Mr. Ritzenthaler is assistant curator of anthropology at the Milwaukee Public Museum.

March 19—Cajun Country

Alfred M. Bailey

"Cajun Country" is an all-color film showing the beauties of the moss-hung live-oak country of southern Louisiana, the land of Evangeline, where the Acadians, banished from Nova Scotia, have made their thriving communities. It is a pictorial story of the bayous and marshes teeming with wildlife. Hordes of geese, the nesting communities of marsh- and island-dwelling birds, alligator hunting, and the life of the Acadians of this romantic southland are shown, all filmed by a naturalist-photographer. Dr. Bailey, formerly a member of the staff of this Museum, is now Director of the Colorado Museum of Natural History in Denver.

March 26—Caravan to Tibet

Nicol Smith

Mr. Smith was in Tibet shortly before the Dalai Lama sealed the border against all foreigners in December, 1947. He was the last American to leave the country, bringing a full pictorial record of the western section of that exotic land. His color films and lecture are the record of the search for the "real-life Shangri-La"—the fabulous Valley of Hemis. The film shows the long and arduous journey through the lofty mountains, over jagged and narrow rock passes, and the arrival finally in the hidden Valley of Hemis where exotic religious rites and dances before a thousand-year-old golden Buddha were performed.

RESERVED SEATS FOR MEMBERS

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

April 2—Coconuts and Coral

Alexander Spoehr

The native peoples of Micronesia, their past cultures, and their present problems are presented by Dr. Spoehr, who is the Museum's Curator of Oceanic Ethnology. He portrays in detail the life of the Marshall Islanders, among whom he lived as an anthropologist studying their ways of life.

Note: Mr. James B. Pond was originally scheduled to lecture on "Jamaica, Island of Contrasts," on this date, and is so announced in many posters and circulars printed early, including that enclosed with this Bulletin. Because of serious illness, Mr. Pond was forced to cancel his engagement, and Dr. Spoehr is taking his place.

April 9—A Multitude of Living Things

Lorus J. Milne

Dr. Milne and his wife, Margery, are well known for their recent book appearing under the same title as this lecture. The Milnes' color film is a record of adventures in natural science from Florida to Puget Sound. It is principally a series of intimate studies of small mammals, birds, crustaceans, and other creatures, not impressive for their size but fully as interesting as the largest big game animals. Presented are fascinating close-up views of the insect life revealed when a log is turned over, the queer denizens of sun-baked desert sands, the life of toads, crabs and spiders—the population of all out-of-doors—woods, mountains, and sea coasts.

April 16—Journey to Japan

Telford H. Work

For many years before the war, Japanese authorities prevented the making of photographs in Japan and its possessions. Dr. Work's film is rare in being one of the few color-picture documents made in Japan since modern color photography has been perfected. The pictures and narrative start with an air trip to Hawaii, the Marshall Islands, and Guam. Then there is a voyage aboard a Navy oil tanker to Japan. There the life of people in cities and rural areas is recorded as well as hundreds of scenic features, including the "Sacred Mountain," snow-capped Fujiyama.

April 23—A Naturalist in Changing New Zealand

Robert Cushman Murphy

Dr. Murphy, who is chairman of the Department of Birds at the American Museum of Natural History in New York, presents in his lecture and films the story of an expedition to collect both fossil and modern birds. The collection he obtained is regarded as one of the most significant in recent paleontological history.

April 30—Antarctic Adventure

Commander Finn Ronne

In 1947–48, Commander Ronne led a party of twenty-two scientists and fellow-explorers aboard a former Navy tug on a 7,000-mile journey to Palmerland, Antarctica. They took with them three airplanes for use in geographic exploration and aerial mapping. This lecture and color film is the record of the expedition. The principal studies undertaken were in connection with weather phenomena, geological formations, terrestrial magnetism, tidal readings, seismograph recordings, and cartography. Commander Ronne flew 39,000 miles on mapping missions through air so pure that a pilot could see 200 miles ahead. The expedition discovered 250,000 square miles of hitherto unknown territory. Commander Ronne's wife, Edith, was a member of the expedition and the new-found land was named in honor of her. For eighteen months in the polar area the expedition carried, among other things, 6,500 pounds of filet mignon!

It has taken 55 years to collect the material in the Museum's exhibits. Don't try to see it all in a day. Come repeatedly, and avoid fatigue by limiting yourself to an hour or two on each visit.

BIRD-OF-PARADISE FLOWER

By THEODOR JUST
CHIEF CURATOR, DEPARTMENT OF BOTANY

One of the most conspicuous flowers often seen in greenhouses or in florists' shops is a native of the coastal region of South Africa, variously known as queen's bird-of-paradise flower, bird's-tongue flower, queen-plant, crane flower, or as geel pisang in the Boer language. Introduced in 1773 at Kew in England by Sir Joseph Banks, this plant was named *Strelitzia reginae* in honor of Queen Charlotte Sophia, wife of England's King George III and daughter of the Prince of Mecklenburg-Strelitz. It is justly regarded as one of the most beautiful members of the banana family (Musaceae).

MEMBER OF BANANA FAMILY

The bird-of-paradise flower (Strelitzia reginae) is a native of South Africa. The Museum exhibit pictured above was reproduced from nature by Curator of Exhibits Emil Sella from specimens presented by Garfield Park Conservatory.

This plant is on display in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29) in the case showing members of the banana family. The Museum exhibit was modeled by Curator of Exhibits Emil Sella after a living specimen received from Garfield Park Conservatory.

The striking irregular flowers and large banana-like leaves give this trunkless plant its exotic appearance. The flowers are borne near the top of the flower-stalk, which normally is as long as the petiole and about 3 feet high. At first completely surrounded by the green, boat-shaped bract, the flowers emerge one by one as older flowers die off. Their orange-yellow sepals are lance-shaped, 3 to 4 inches long, and stand in marked contrast to the three dark-blue petals. The latter are unequal; the median (odd) one is shorter, dome-shaped, and covers the entrance to the honey, while the paired ones are so closely placed that they overlap and appear to be halves of a single arrowhead-like organ (the "tongue"). The stamens lie in the groove formed by these petals, whereas the deeply cleft style usually projects in front of them. The "tongue," stamens, and stigma are composed of slightly hardened tissues and are rather stiff.

Like its nearest relatives, the banana and the traveler's tree, Strelitzia is bird-pollinated. Certain sun-birds (*Nectarinia afra*), the African equivalents of the American hummingbirds, have breasts colored like Strelitzia flowers. When visiting these flowers the birds first touch the exposed stigma, then come to rest on the "tongue" (functioning as a "landing platform"), and, by walking on its flanges, separate them and thereby release the stamens. As a result, their breasts are dusted with pollen as they bend down to reach the honey buried under the dome-shaped petal. Apparently a single visit is sufficient to effect pollination. Although bees and other insects frequently suck the gummy juice exuding from the bract, they are more likely to be eaten by birds than to bring about pollination in Strelitzia, but they may do so in the banana. The peculiar floral structure, the presence in its flowers of complementary colors, which are supposedly best suited to bird vision, the large amount of honey present, and the fact that one visit by a bird ensures pollination substantiate the claim that Strelitzia possesses the most advanced type of pollination by birds.

BIRD MIGRATION—

(*Continued from page 3*)

listing the average dates of arrival and departure in the Chicago area of one hundred common migratory birds.

TRAVEL HAS HAZARDS

Some of the mystery formerly associated with bird migration has been swept away by the work of competent observers stationed throughout the world. From their reports we now know that migration occurs at night as well as by day, although many species prefer one period or the other. Civilization has considerably increased the normal hazards encountered by night migrants. Tall buildings, factory chimneys, and particularly lighthouses take a heavy toll of low-flying birds annually, a circumstance that was widely publicized last autumn when hundreds of small song birds flew to their death against the skyscrapers of Rockefeller Center in New York. Similarly, as many as seven hundred migratory birds have been destroyed by striking the Statue of Liberty in a single month and, in former years, a single night's mortality caused by the Washington Monument sometimes exceeded one hundred birds.

Contrary to popular opinion, birds are unable to foretell adverse weather. Migrants not infrequently continue northward or delay their departure for more clement areas regardless of conditions that may lead to their destruction. Occasionally a species is so decimated by catastrophic weather conditions encountered during migration that its status over a large area may be affected for several years thereafter. In March, 1907, approximately 750,000 Lapland longspurs lay dead on the ice of two small Minnesota lakes, the victims of unexpected inclement weather. At the same time, lesser concentrations of frozen birds were reported over an area covering 1,500 square miles. In October of the previous year a sudden drop of temperature destroyed countless thousands of small migrants on Lake Huron, as many as 5,000 bodies to the mile being found along the shoreline. Similar catastrophes periodically have befallen migratory woodcocks, bluebirds, purple martins, and many others.

FLIGHT SPEEDS

The altitude above sea level at which birds migrate and their speed of flight have long been subjects of controversy. In recent years much has been learned about both by the use of telescopes and theodolytes and from observations made by aviators. Birds have been recorded at 29,000 feet above sea level, but it is now known that the vast majority migrate well below altitudes of 5,000 feet. Migratory speed generally is moderate, being considerably below the rate that may be achieved by the species for short distances. Small birds average only 23 miles a day initially in passing up the Mississippi Valley in spring, but may travel 200 miles a day during the latter part of their journey. On the other hand, many large birds normally fly several hundred miles each day during migration.

Much less is known with certainty of the origin and evolution of bird migration. Various theories have been propounded, some naively simple and others very involved, but even today there is no general agreement among those who seek an absolute answer. It seems certain, however, that a phenomenon of such complexity had no single origin but developed through the interactions of numerous factors.

The new case was designed by the Division of Birds and prepared by Miss Norma Lockwood, Staff Illustrator, and Mr. Kenneth Woehlck, Assistant Taxidermist.

STAFF NOTES

Mr. Karl P. Schmidt, Chief Curator of Zoology, has been elected a corresponding member of the Zoological Society of London. . . . For "unusual and outstanding work in the field of botany and conservation," **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, has been elected to honorary membership in the Friends of Our Native Landscape.

Visiting Hours Change March 1

Beginning March 1, spring visiting hours, 9 A.M. to 5 P.M., will replace the winter schedule of 9 to 4. The new hours will continue in effect until April 30.

AWARDS ANNOUNCED IN 4th CHICAGO INTERNATIONAL NATURE PHOTO EXHIBIT

Upper left: "Columbia Ice Fields," by Alfred Blyth, Edmonton, Alberta, Canada, winner of a first-prize silver medal. Upper right: "Tiger Lily," by Dr. R. R. LaPelle, Philadelphia, honorable mention. Lower left: "Predator at Bay," by Tommy Lark, Tucson, Arizona, honorable mention. Lower right: "Snake Bird Study," by R. A. E. Cavendish, Lafayette, Louisiana, honorable mention.

The final tally on the Fourth Chicago International Nature Photography Exhibition, held at the Museum February 1 to 28 under the auspices of the Nature Camera Club of Chicago, reveals that a total of 2,234 pictures was entered. That makes this event the largest and most successful of the series, which began in 1946, and one of the largest and most important regularly held

contests of its kind in the world, according to camera-club authorities.

The increasing success of this annual event is due to the efforts of the exhibition committee of the sponsoring organization. As the club is small, this committee comprises almost the entire membership. The high standards of performance and conscientious attention by the committee, and particularly its chairman, Mr. H. J. Johnson, to the vast amount of detail involved in an exhibition of this kind have resulted in the leadership now manifest. The methods of processing entries, conducting the judging, and services to the contestants not only meet the standards of the Photographic Society of America but are believed to surpass them in several respects.

Of the total entries, 1,682 were color slides and 552 were black-and-white, large-size prints (with a sprinkling of color prints). These were submitted by 547 persons in all parts of the United States and Canada, and various countries of Europe, South America, and even Australia.

The pictures accepted for exhibition—218 prints and 510 color slides—represented the work of 386 persons. Several pictures are reproduced in this BULLETIN—one on the cover. The exhibition in Stanley Field Hall and the two projection-screenings of color slides on Sundays in the James Simpson Theatre attracted large crowds.

Following are lists of medal winners and awards of honorable mention:

MEDAL WINNERS

Black and White Photographs:

ANIMAL LIFE SECTION: Edwin J. Howard, Oxford, O.—*No Housing Problem.*

PLANT LIFE SECTION: H. J. Ensenberger, Bloomington, Ill.—*Dawn's Pawns.*

GENERAL SECTION: Alfred Blyth, Edmonton, Alberta, Canada—*Columbia Ice Fields.*

Color Slides:

ANIMAL LIFE SECTION: L. D. Hiett, Toledo—*Horned Grebe.*

PLANT LIFE SECTION: Alfred Stettler, San Francisco—*Horrest Time.*

GENERAL SECTION: M. G. Fox, Honolulu, Hawaii—*Shifting Sonds.*

HONORABLE MENTIONS

Black and White Photographs:

ANIMAL LIFE SECTION: G. M. Bushman, 11412 Wallace St., Chicago; Beatrice Hoberecht and Hal G. Hoberecht, 4810 Lake Park Ave., Chicago; W. E. Murray, 30 S. Michigan Ave., Chicago; Alfred Blyth, Edmonton, Alberta, Canada; Martin Bovey, Jr., Concord, Mass.; R. A. E. Cavendiah, Lafayette, La.; Charles J. Cignatta, Baltimore; Howard E. Foote, New York City; C. L. Herold, Houston; Clark Hogan, Oklahoma City; Tommy Lark, Tucson, Ariz.; George F. Lawrence, Westcliff-on-Sea, Essex, England; L. A. Lyons, Port Kembla, New South Wales, Australia; Carl Manafield, Bloomingdale, O.; H. J. Ensenberger, Bloomington, Ill.; Y. van de Peppel, Gilderland, The Netherlands; Eugenio Petraroli, Milan, Italy; Louia Quitt, Buffalo; William J. Stube, Niagara Falls; G. Grant Thomson, Brisbane, Queensland, Australia; and Alfred Watson, Buffalo.

PLANT LIFE SECTION: Henry S. Burnside, Berwyn, Ill.; Ben Hallberg, Brookfield, Ill.; Blanche H. Adams, Phoenix, Ariz.; Howard E. Foote, New York City; Dr. R. R. LaPelle, Philadelphia; R. E. Lawrence, Washington, D.C.; Ruth Sage, Buffalo; and Louis Quitt, Buffalo.

GENERAL SECTION: Ray L. Carroll, 6143 S. Troy St., Chicago; Louise Broman Janson, 6252 S. Kedzie Ave., Chicago; Henry S. Burnside, Berwyn, Ill.; Frank E. Fuller, Bloomington, Ill.; Dr. R. R. LaPelle, Philadelphia; L. A. Lyons, Port Kembla, New South Wales, Australia; William J. Stube, Niagara Falls; and Dr. Carrol C. Turner, Memphis.

Color Slides:

ANIMAL LIFE SECTION: Herbert P. Burtch, 5524A Ellis Ave., Chicago; Margaret J. Hawk, 1440 E. 60th Pl., Chicago; Albert N. Brown, 5256 Warner Ave., Chicago; Dr. Wm. H. Holmes, 122 S. Michigan Ave., Chicago; J. Klinenberg, 5101 Ingleside Ave., Chicago; Harry A. Langer, 2407 N. Orchard St., Chicago; L. F. Urbain, 1217 W. Washington Blvd., Chicago; Iva Palmer, 1212 Central St., Evanston, Ill.; R. W. Allen, Louisville; Howard W. Butts, West Salem, Ore.; Henry J. Grefe, Saginaw, Mich.; L. D. Hiett, Toledo; Edward A. Hill, Fleetwood, Pa.; Mary E. Owens, Toronto, Canada; W. A. Pluemer, Plainfield, N. J.; W. H. Savary, North Plainfield, N. J.; Mary Shaub, Northampton, Mass.; Harry L. Standley, Colorado Springs; A. Stewart, Santa Barbara, Calif.; Mary Lowber Tiers, New York City; and Marvin F. Ward, Los Angeles.

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GENERAL SECTION: F. Menne, 348 W. 102 St., Chicago; Helen C. Rahe, 2627 Gregory Ave., Chicago; R. H. Souers, 501 N. Central Ave., Chicago; O. E. Schmidt, Elmwood Park, Ill.; J. M. Brown, Honolulu, Hawaii; Herman Cohn, Holland; Albert H. Duvall, Galesburg, Ill.; M. J. Geary, A.P.O. San Francisco; Shirley H. Houston, Rochester, N. Y.; Mrs. Henry S. Lindsley, Denver; J. F. Madsen, Berkeley, Calif.; Charles B. McKee, San Francisco; John B. Moran, Marlborough, Mass.; Dr. B. J. Ochsner, Durango, Colo.; Dr. Robert W. Price, San Francisco; Harry A. Sickels, San Francisco; R. C. Smith, Port Huron, Mich.; Wella W. Smith, Salt Lake City; G. H. Swearingen, Louiaville; and Sandra Thaw, Washington, D.C.

MOVIES FOR CHILDREN SATURDAY MORNINGS

The Spring Series of free motion picture programs for children will be presented on nine Saturday mornings throughout March and April under the auspices of the James Nelson and Anna Louise Raymond Foundation. All of the programs begin at 10:30 and will be given in the James Simpson Theatre of the Museum. In addition to motion pictures, there will be lecturers on five of the programs.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

Following is an outline of the programs:

March 5—ADVENTURES ON LAND AND SEA

A whaling expedition, hunting big game, bouncing across a desert, Indians

Talk by C. J. Albrecht

March 12—MALAYAN JUNGLES TO JAVANESE TROPICS

How people live in these regions

Also a cartoon

March 19—DOWN NORTH

Sailing along the Labrador coast, a trip of adventure

Talk by Alfred M. Bailey

March 26—OUR OWN NORTH WOODS

The home of Indians of long ago and today and of many interesting animals

Also a cartoon

April 2—FROM POLAR BEARS TO PENGUINS

American animals from the Arctic to the Antarctic

Talk by Marie Svoboda

April 9—A MULTITUDE OF LIVING THINGS

Strange creatures of our native land—insects, crayfish, clams, and crabs

Talk by Lorus J. Milne

April 16—FLOWERS IN ACTION

Did you ever see a flower open, a plant eat or dance? These things are shown in these pictures taken by John Ott

Also a cartoon

April 23—STRANGE SEA ANIMALS

An octopus swims, a scallop walks, a barnacle waves in these color pictures of sea animals

Talk by Lorain Farmer

April 30—SPRING FEVER

Lazy days, warm sunshine, fishing, swimming, and adventures

Also a cartoon

A Special Exhibit . . .

WATER COLOR PAINTINGS OF CALIFORNIA FLOWERS

Ethelynde Smith, a noted concert singer who gave up that career for one in art and has attained equal plaudits for her talents as a painter, will give Chicago its first view of her water colors of California flowers in a special exhibit to be held in Stanley Field Hall of the Museum for four weeks beginning Saturday, March 5. Miss Smith has exhibited her paintings in ten cities of the Atlantic and Pacific coasts, and her "one-man show" is coming to this Museum directly from its presentation at the American Museum of Natural History, New York, where it was viewed by many thousands of persons.

The exhibit comprises 49 life-size florals. Art critics as well as naturalists have pronounced them vivid and true in color and real in their representation of the characteristics of the plants, which range from tightly sheathed buds to full-blown flowers. Among flowers depicted are dahlias, camellias, hibiscus, bird-of-paradise flower (see article in this BULLETIN by Dr. Theodor Just), orchid cactus, angel's trumpet, wisteria, and magnolia. Labels with the paintings provide botanical details concerning the flowers represented in each.

The paintings have been exhibited in several art museums.

BOTANICAL EXPEDITION ON GULF COMPLETED

On February 7, Dr. Francis Drouet, Curator of Cryptogamic Botany, returned from three and one-half months of botanical exploration of the northeastern coast of the Gulf of Mexico from Louisiana to Florida. The principal object of the expedition was to collect the algae that hitherto have been as unknown in most of this region as in the least accessible parts of the world. Because of the low salinity of the Gulf waters and the absence of rocks and reefs, the larger seaweeds proved to be scarce. On the other hand, the smaller algae—especially the blue-green algae—were abundant everywhere, in fresh, brackish, and salt water, on the soil, and on trees.

The first month was spent in southern Louisiana, from Lake Charles to New Orleans, in the marshes and bayous and on the more easily accessible beaches. For a week Mr. Robert P. Ehrhardt, of Seattle, collected with Dr. Drouet. In the Mississippi River delta area, the success of the work was due largely to the enthusiastic co-operation of Mr. Percy Viosca, Jr., author of *Louisiana Out-of-Doors*. Several days were spent in the pine hills and flats of the Florida parishes of eastern Louisiana and in southwestern Mississippi with Dr. Lewis H. Flint, of Louisiana State University.

During three weeks the cryptogams of the maritime region of Mississippi and Alabama were studied, partly with the assistance of Dr. R. L. Caylor, of Mississippi Delta State Teachers College, Dr. A. D. Bajkov and Dr. A. E. Hopkins, of Biloxi Oyster Laboratory, and Mr. Harold B. Louderback, of Argo (Illinois) High School.

At the invitation of Dr. Chester S. Nielsen, headquarters were established at Florida State University at Tallahassee for the exploration of the Florida coast from Pensacola to Cedar Keys. Through the co-operation of Dr. Herman Kurz, Dr. Nielsen, Dr. Grace Madsen, Miss Eva May Atwood, and Miss Dorothy Crowson, the entire coastal region was rather thoroughly examined during five weeks. A short trip through central Florida as far south as Lake Wales was made with Dr. M. A. Brannon, of the University of Florida. Collections were also made for comparative purposes at several points on the Atlantic coast of Florida.

It is estimated that from 10,000 to 15,000 specimens of cryptogamic plants were accumulated and sent to the Museum during the course of this expedition.

Contributions of Funds

Mr. Elmer J. Richards and Mr. Donald Richards, Research Associate, both for years associated with the Museum as volunteer workers in the Department of Botany, have each contributed $5,000 for Museum purposes. Other recent cash gifts include $200, from Mrs. Hermon Dunlap Smith, Associate in the Division of Birds, and $100, from Mr. Karl P. Schmidt, Chief Curator of Zoology.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

"In Halls 35 and 36 the vertebrate fossils collected by the Bad Lands expedition of 1898 have been installed as fast as they were made ready. The specimens now on exhibition include a magnificent skull of *Titanotherium ingens*, being one of the largest and most perfect ever found. . . ."

[This skull is atill considered one of the finest of its kind. Dr. Henry Fairfield Osborn, a leading authority on these animals, called it a "superb" example of the species. It may now be seen on exhibition in Ernest R. Graham Hall (Hall 38) under the scientific name *Menodus giganteus*.]

Former Curator E. S. Riggs with Menodus giganteus

"During April . . . Mr. George A. Dorsey, Curator of the Department of Anthropology, accompanied by Mr. Phillips, of Evanston, visited Mill Creek, Union County, Illinois, and collected a very large number of stone implements and rejects. More recently Mr. Dorsey visited the Pomo Indians of California, and had a most successful trip. From California he went to Tacoma, where he was joined by the modeling force, and casts of Indians of that section, intended to represent the principal aboriginal industries and customs, were obtained. From Tacoma the expedition went to Vancouver Island, for the purpose of taking of several Kwakiutl Indian casts intended for a large ceremonial group illustrating certain phases of religious life."

African Serpent Deity

Aido Hwedo is a serpent deity of Dahomey, West Africa. He is the god who carries thunderbolts to earth and lies under the crust of the earth to support its weight. There is a belief, here and there, that earthquakes are due to the wriggling of the serpent god.

GIFTS TO THE MUSEUM IN LAST MONTH

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Mrs. R. C. Wheeler, Chicago—a fabricated shrunken head, Ecuador; Mrs. L. Byron Nash, Highland Park, Ill.—75 ethnological specimens and a case of Koa wood, Hawaii and Samoa; E. A. Haeger, Palos Heights, Ill.—a carved wood statue, Tabar Island, Melanesia.

Department of Botany:

From: Ecuadorian Balsa Export Co., S. A., Guayaquil, Ecuador—17 boards of tropical woods, Ecuador; Fred Meyer, St. Louis—74 herbarium specimens, chiefly Missouri; Silvio Yepes, Popayán, Colombia—300 herbarium specimens, Colombia; Grand Rapids Public Museum, Grand Rapids, Mich.—187 fern specimens, Hawaii.

Department of Zoology:

From: Comm. George R. Salisbury and Col. Sam T. Salisbury, through the University of Missouri, Columbia, Mo.—45 bird skins, Laysan Islands; Col. Clifford C. Gregg, Valparaiso, Ind.—16 mammals, Germany, and 39 reptiles and amphibians, South Africa; U. S. Naval Medical Science Group African Expedition, Naval Medical Research Institute, Bethesda, Md.—2 elephant shrews, Torit, Anglo-Egyptian Sudan; Lincoln Park Zoo, Chicago—a mammal specimen, Peru; Walther Buchen, Chicago—19 bird skins, Tanganyika Territory; Boardman Conover, Chicago—a Florida fox squirrel, Florida.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; Dr. Henry Field, Washington, D.C.; Natural History Museum, San Diego, Calif.; Karl P. Schmidt, Homewood, Ill.; Eugene S. Richardson, Jr., Winnetka, Ill.; and Boardman Conover and Walter L. Necker, both of Chicago.

NEW MEMBERS

(January 16 to February 15)

Associate Members

Dr. John H. Gilmore, Miss Olive Mazurek, Edward Foss Wilson.

Annual Members

Mrs. Henry G. Barkhausen, William T. Cameron, Thomas B. Chace, David E. Davidson, Robert Sidney Dickens, Raymond W. Dosé, A. J. Egan, George E. Fox, Dr. W. F. Geittmann, John C. Gekas, Theron G. Gerow, Lawrence E. Goble, Maxwell A. Goodwin, Dr. Charles F. Greene, William J. Hagenah, Jr., Mrs. Thomas M. Howell, L. R. Howson, Andrew V. Huber, Herbert F. Huch, Dr. Elizabeth Jager, Leslie H. Klawans, Dr. Ernest L. Klein, M. L. Kresge, Herbert F. Lello, Arthur G. Lindell, Joseph M. Linn, Frank J. McNerney, Ernest P. Miller, Miss Constance L. Peck, L. J. Quetsch, T. C. Ragland, William D. Reese, Frank S. Sims, W. Ellis Stewart, A. H. Van Kampen, V. R. Van Natta, Norman E. Watson.

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Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

A GLIMPSE OF NEW ZEALAND

Mr. Karl P. Schmidt, Chief Curator of Zoology, makes the following report on his recent trip "down under":

As delegate of Chicago Natural History Museum and of the National Research Council to the Seventh Pacific Science Congress, it was my privilege to journey from the Northern to the Southern Hemisphere, from midwinter to midsummer, and, at the International Date Line, from today to day after tomorrow. Meetings for programs and discussion, both formal and informal, were held at Auckland and Christchurch, New Zealand, February 2 to 22. The occasion was seized by our New Zealand hosts to show off their two great islands to their guests by means of especially instructive inter-sessional and post-sessional tours.

The benefits of such international gatherings, which bring men and women of the most diverse sciences and from varied countries into contact, are largely intangible, and many of these benefits have long-term rather than short-term effects. It is accordingly difficult to assess the values of programs and meetings, discussions and new friendships without some perspective of time. The most immediate impact on New Zealand science was perhaps made by the programs on oceanography and fisheries, by the discussions in the divisional meetings for agriculture on soil erosion, and by the symposia on conservation in general. As for the effect on the visiting delegates, it is my impression that the novelty of the New Zealand scene in almost every aspect—geological, botanical, zoological, and cultural—by a kind of shock treatment, produced instant widening of mental horizon, quite like that of a first view of the tropics in my own personal experience.

With a few days available before the meetings and nearly two weeks after them, before the departure of my return plane, I was able to make some studies of New Zealand reptiles and amphibians and to obtain further glimpses of the plants and animals that make New Zealand so much a land of contrast with other temperate regions.

A TUATARA

A holdover from the Age of Reptiles, studied by Chief Curator of Zoology Karl P. Schmidt on recent New Zealand journey. Tuataras grow to a length of about two feet. Photograph made at Brothers Island, Cook Strait (courtesy New Zealand Travel Bureau).

In the vegetation the great preponderance of ferns, especially beautiful tree ferns, is a conspicuous feature. The less conspicuous club mosses include links between major divisions of the plant kingdom. In the animal life, the extraordinary absence of all mammals and snakes, the extreme peculiarity of some of the types of birds, and, among the insects, an unusual proportion of "missing links" (i.e., links missing elsewhere in the world) give the original fauna an extremely archaic and thus extremely interesting character.

The first reaction of both botanist and zoologist to New Zealand may lie in a disappointment at finding so great a proportion of the island denuded of its original vegetation and such vast introductions of foreign plants and animals. The second reaction will be a thankfulness for the preservation of the remnants of original forest and fauna in the national parks and water-supply reserves, and a third lies in the realization of the unique interest of the phenomena of introduction and spread of the acclimatized plants and animals of Australia, Eurasia, and North America.

I was able to see the famous New Zealand tuatara, the lizard-like relic of the Age of Reptiles, on three small off-shore islands, and to form some estimate of the numbers of this remarkable reptile. It now seems certain that it is no longer in danger of extinction, thanks to government protection.

THIS MONTH'S COVER

The greatest of all bears—the Alaska brown bear—as shown in a new habitat group in Hall 16, is depicted on the cover of this BULLETIN. The large male standing erect on its hind feet at the right towers nearly nine feet above the ground.

"These bears, sometimes called fish bears, are not only the largest members of the bear family but also the largest flesh-eating animals in existence today," says Colin C. Sanborn, Curator of Mammals. "When full-grown, they stand over four feet at the shoulder, have a length of eight to nine feet, and may reach a weight of more than 1,500 pounds. During the summer they feed on salmon, which accounts for the name fish bear. At other times they eat kelp, berries, mice, and ground squirrels. Despite their gigantic size, they are shy and cautious and do not attack man unless they are cornered or greatly provoked, when their fury and power may lead them to kill."

An account of the collecting of the bear specimens, by Janice Street, who accompanied her husband, William S. Street, on the expedition that he sponsored and led for the Museum, is on page 3.

Museum Television Program—April 13

"Pride Goes to the Head," a special television sketch with an Easter bonnet motif, will be presented by members of the Museum staff on the "Women's Magazine of the Air," television program on WGN-TV. The presentation will be between 4:00 and 4:30 P.M. on Wednesday, April 13. Using examples of bizarre hats from both primitive and civilized peoples all over the world, selected from collections in the Department of Anthropology, the young women from the Museum will demonstrate that many of these are not much if any more grotesque than some of the creations of Paris, Hollywood, and New York millinery designers. Miss Harriet Smith, Mrs. June Buchwald, and Miss Lorain Farmer collaborated in the script, in which they will take the roles of two millinery designers and a Raymond Foundation staff member. This program is based on stories and materials to be used in a special Easter tour in the Museum on the following Friday, April 15.

Models of the solar system, the interior of the earth, and the visible half of the moon may be seen in Clarence Buckingham Hall.

STORY OF HUNT IN ALASKA FOR WORLD'S LARGEST BEAR

A habitat group of the world's largest species of bear—the Alaska brown bear (of which there are several varieties including the Kodiak bear, restricted to the island of the same name)—was added last month to the series of ecological exhibits in the Hall of American Mammals (Hall 16) of the Museum.

The expedition that collected the bears was personally undertaken as well as sponsored by Mr. and Mrs. William S. Street. Mr. Street is a former Chicagoan, well known in business circles here and now a prominent executive in Seattle, Washington.

There are four bears in the habitat group —a huge male standing erect on its hind feet in a characteristic attitude so that it towers nearly nine feet above the ground, its more moderate sized mate, and her two cubs about one year old and grown to a fair size for youngsters. The bears are displayed in a reproduction of a scene in Pavlof Bay of the Alaska Peninsula with a snow-covered mountain looming in the background. The animals were shot by Mr. and Mrs. Street near Mother Goose Lake on the Alaska Peninsula. Taxidermist C. J. Albrecht, who was a member of the expedition that collected the specimens, prepared the group.

An account of the expedition by Mrs. Street is presented herewith.

By Janice Street

ON A crisp, windy day—the 16th of May, 1947—our party left Naknek Airport on Bristol Bay for Mother Goose Lake. Our destination was due south from Naknek down the Alaska Peninsula, 50 minutes by plane—days at least, perhaps never, on foot at this time of year. There were six in the party. Besides Bill Street there was John (C. J.) Albrecht representing the Museum. He was to mount the group of Alaska brown bears when it was complete, and so he wanted innumerable and exact measurements and masks of the heads and feet for perfection of detail and expressions, plus movies of the wild life and country in general.

No hunt can be successful without competent guides and we were fortunate to have two of the best, Harold Curtis, who was also outfitter, and Tom Moore, who brought with him a wealth of outdoor experience. Also Jimmie Moore, his wife, who was not only an excellent cook but handy man. I made the sixth.

SMOKING VOLCANO

We flew over flat tundra country, dotted with hundreds of tiny lakes and potholes. Mt. Peluk was the first peak we saw, snowy and lovely, until we circled in over a low pass for our first view of Mother Goose Lake, a lake several miles long and a mile or so wide, with Mt. Chiginagak dominating the whole scene. Brown hills covered with grass flattened by the winter snows rolled back from the lake, where they merged with snow-capped ridges. The upper end of the lake opened into a long valley completely flanked by steep ridges rising about 2,000 feet from the floor of the valley. Mt. Chiginagak rose over all in majestic splendor. Still an active volcano and with smoke pouring out the side, it was promptly dubbed "the old man with the pipe."

Museum specimen was quite different from getting a personal trophy. The size and condition of the hide were of vital importance. What might appeal to us would not do for the Museum. Each bear we saw had to be looked over carefully.

The days we hunted, and we hunted every day the weather permitted, were long and the distances we walked far. Often we did not reach camp until 10 or 11 o'clock at night, which still brought us in before dark.

A PRIZE SPECIMEN

This bear was judged 2nd world's record in size of head by Boone and Crockett Club, Alaska sportsmen's organization. Measurements were: 26 inches, nose to back of head; 60 inches around neck; 7 feet around body; 34 inches around foreleg; and 8 feet 6 inches, nose to tail. Members of the expedition in the picture are (left to right): Mrs. William S. Street, Tom Moore, and Harold Curtis.

Camp was set up among the leafless cottonwoods and close by were plenty of dead trees to insure sufficient wood for cooking and comfort. When the men began to stake down the tents and ran into frozen ground, ice cold and damp to the touch, a few inches under the moss, they said they had hit Alaska.

FIRST BEAR TRACKS

Immediately bear tracks were discovered in the undisturbed snow on the low ranges behind camp. The tracks seemed to come off the steep cliffs. It was good to know that the bears were out of hibernation. Each night in the warmth and friendliness of the cook tent the day's experiences were related, tall tales told, and the hunt for the following day mapped for Bill's party and for mine.

Although we had been on several hunts, we soon discovered that hunting for a

Several times some of the party found it necessary to "siwash" it out all night, as when Bill and Tom crossed the lake and the sudden heavy winds turned the glassy water into a choppy sea, making the crossing impossible in the rubber boat. They took shelter under a gnarled willow tree and with a good fire sat out the storm. Or the time Bill, Harold, and I spotted a bear in the late afternoon, high on the ridge across the valley from where we were sitting. Harold thought it would take about three hours to reach him. Even though we were not sure of his size, we felt that as long as we were hunting for the Museum we must look him over.

After wading streams, climbing steep hillsides of shale, working through alders, and scaling a forty-foot bluff, it was after 8 o'clock when we reached the bench that was our goal. Only then did we find the bear was too small to shoot. He came within

75 yards of us, turning rocks and hunting insects. He then turned and worked toward the top, and in the twilight we watched him go over the mountain. I've since had cause to regret the decision to pass him by because he was the last bear I had opportunity to take as a personal trophy.

By this time it was after 9 o'clock. The sun was setting on one side of us and the moon rising on the other. The mountains were gorgeous in the fading light of sunset. And that alone made the climb worth while. There was no shelter, and so we huddled into the side of the hill around a fire of damp grass, which, incidentally, laid a smoke screen over the valley.

A little after 3 A.M. it was light enough to start on the last short climb to the top, where we came on to the snow fields at the base of Mt. Chiginagak. They were beautiful beyond description, with the changing colors of sunrise and the mountain standing chiseled against a brilliant blue sky. Looking down we had a splendid view of the benches below and the valley beyond with the streams, lakes, and tundra that made going so difficult at times.

HUGE SPECIMEN BAGGED

As the days began to pass with no bears in camp, we suggested that the guides shoot at any specimen suitable for the Museum that the hunters might miss or only wound. At the end of two weeks that very thing occurred. Bill, Tom, Harold, and I crossed the lake and started for a ridge that had not been hunted. Almost immediately we ran into a stream that appeared to cut us off. When a wadable spot was found, it was decided that Bill and Tom would investigate the flats to see if we could go on. They had been gone just a short time when we saw two moose that ran out above the timber as though they had been startled.

Watching, we soon saw a bear trotting across the hillside quite low and coming along behind her was a big bear. A spring idyll, no less. We knew Bill and Tom had seen one or both of them, for they were beating a hasty line to a cottonwood grove to get in a strategic position. The bear evidently heard some sound or became suspicious because she whirled and veered off at an angle without alarming her partner. He came on to the exact spot and turned to run too late. Bill and Tom, slightly apart in the trees, each had a quick shot and Tom got him.

He was an enormous specimen. His head was massive and his tremendous legs gave evidence of his strength. When we came up and looked at him we knew he was in the record class. Unfortunately the hide proved unusable for mounting purposes, but John did make a mask and brought the skull to camp. The head has since been awarded by Boone and Crockett Club the second place in record heads of Alaska brown bear. The fleshing beam that had been prepared to take care of the hide was never used.

Losing the hide sent Bill back to Alaska last May to procure the male for the group, which he did. It proved to be excellent in size and appearance and makes the group complete.

While we hunted we found many interesting wild-life subjects for movies and pictures, such as the red fox that came into camp several times to pick up scraps, swan on the upper lake, harlequin ducks in their gayest plumage, the beaver warning her kit of danger by giving the water a resounding smack with her broad flat tail, and the otter swimming and diving for fish in the river while keeping an alert eye on the hunters. A deep yellow and brown porcupine balanced precariously on a willow and the greater yellow-leg snipe that had a nest just a foot off the bear trail where we passed so often. A few moose, one in particular outlined on a ridge against a flaming sunset sky while she barked her fright and disapproval. Two baby moose, all legs and ears, a few days old, that Bill found bedded down in the willows. Caribou that stood obligingly for pictures, and the big old scraggly bear peering up at us trying to get our wind as we came so close to him through the alders. The beautiful bear that came straight onto us as we crouched behind spindly willows trying to see if the light spots were rubbed spots.

MOTHER GOOSE LAKE

Mt. Chiginagak, in the background, is an active volcano. In this area Mr. and Mrs. William S. Street and party began their hunt for Alaska brown bear that resulted in the group now exhibited in the Museum and shown on the cover of this BULLETIN.

We had licenses to hunt in the Katmai National Monument, and so at the end of three weeks we moved there to try for our big brownie. Our camp was at Iliuk Arm, where the tents were put up among the green spruce trees. Just in front was a crystal-clear brook.

Our first impression was how green everything looked in comparison to Mother Goose Lake. The beach was a mass of colored pumice. In other places we found flat rock filled with fossilized clusters of shells millions of years old. There were perfect spheres, like cannon balls, that had been blown from volcanoes and now lay half buried in the rock.

From the mountains where we hunted, the view was superb. There were open parks and heavily timbered areas. As we worked around the ridges a tremendous valley lay before us, lush and green looking. We looked down on the famous Savonoski River, with its opaque and glacial water. Its muddy character showed plainly where it joined the clear flowing stream leading into Iliuk Arm. Across the valley we saw a volcanic crater that had the appearance of a huge chair. John named it "Sit-em Easy Mountain." At the end of the valley was a great lava bed, the beginning of the Valley of Ten Thousand Smokes.

The first morning Bill spotted a bear on the ridge behind camp. When two cubs came out of the alders there was real excitement, and everyone took binoculars and watched them sliding down the patches of snow and climbing and sliding down all over again.

After we had worked out a series of signals for me to use in case the bears changed the direction in which they were moving, Bill, Harold, and Tom left camp at 12 noon. At 2:30 they came out above the bears, who were bedded down in a shallow rock slide, and at 2:45 we heard the first shot, then another, and another. As no bears appeared, we were sure they were in the bag. Later Bill confessed he couldn't have taken the three of them if he hadn't known they would be enjoyed by so many people.

It was hours before we saw our party coming up the beach, and when they arrived with their heavy packs, tired but happy, they were met with a barrage of cameras. This time we had the bears in camp and all three were perfect beauties. John was delighted. The next morning he made masks of the mother and one cub to get perfect replicas and took all the measurements necessary.

There were many bear tracks and the hills and draws looked promising, but even though we saw a few bears, none was large enough to interest us. On June 13 we broke camp and in the late afternoon began our relayed trip into Kulik Lake. From the plane the scenery was beautiful—mountains and lakes in every direction. It looked like great country for hunting.

After a week of futile hunting we realized it was too late in the season to accomplish our purpose, and so we returned with three-quarters of the specimens needed for the Museum group. Our consolation lay in looking forward to finishing the group the next year.

Bill Smith called for us in his Norseman and with a 35-mile tailwind speeding us on our way we headed for Naknek and home.

CUBA PALM RESEARCH

By HUGH C. CUTLER
CURATOR OF ECONOMIC BOTANY

Early in March Dr. B. E. Dahlgren, Curator Emeritus of Botany, and I returned from two months of field work in pursuance of research on the palms of Cuba, a project aided by a grant from S. C. Johnson and Sons, Inc., of Racine, Wisconsin. On previous trips the areas covered by the more important kinds of palms had been visited and specimens from these collected for the Museum. Seeds from selected plants had been obtained and planted at the Atkins Garden and Research Laboratory of Harvard University, near Cienfuegos, where the living plants will be studied as they grow.

Palm specimens generally are large and present special problems of collection and preservation, and plants grow very slowly in a greenhouse. Consequently, only the most commonly cultivated ones, such as the coconut, the date, and some of the ornamental ones, have had much attention beyond technical descriptions. On this latest trip we wanted to find some of the less known palms of Cuba and to determine the extent of variability in some of those studied on the 1947–48 expeditions. We were especially interested in finding natural palm hybrids, descendants of palms that had been pollinated by different species. Some of these we had discovered in 1948 and still others had been described earlier by the Cuban botanist, Hermano León.

It is only one hour and five minutes by airplane from Miami to Havana. But we were carrying boxes of cameras, films, a microscope, and an assortment of chemicals, bottles, plant presses, and the not inconsiderable kit of tools necessary to collect palm specimens and preserve cytological material. So we chose the ten-hour overnight boat.

LAW PROTECTS ROYAL PALMS

From Havana we drove eastward on the excellent Carretera Central, a good paved road that runs through the center of the island from Pinar del Rio in the west to Santiago de Cuba in the easternmost province, Oriente. This road is about 720 miles long, or about the distance from Chicago to Philadelphia. For long stretches the road is bordered by planted shade trees, especially an Indian fig with masses of dark green and glossy leaves, and a selection of a few of the native Cuban trees. Many of the fields and minor roads are bordered by rows of the tall, smooth-trunked royal palm, *Roystonia regia*, the most prominent palm in the Cuban landscape. The leaves of this palm are often used to thatch the poorer type of country house and the large sheaths to cover the sides like huge shingles. Royal palm fruits are not eaten by human beings but are fed to pigs. It is now against the law to cut down a royal palm.

Besides the central highway there are very few paved roads, but during the dry season, from October to May, it is usually possible to drive on some of the dirt roads. This year was exceptionally dry; so we were able to visit places that normally could be reached only after days on horseback or on foot. Even so, it was necessary to find a yoke of oxen to pull our car across one muddy ford. Traveling by car enabled us to carry all the equipment needed for studying and collecting palms, and in a long flat box on the roof we could bring back entire leaves without damaging them.

Occasionally a palm had to be cut down to obtain specimens, but usually the wanted parts had to be carefully removed without injury to the growing point at the base of the leaves of the tree. To obtain one complete leaf of a large palm is always a considerable task. The leaf stalks and leaf bases are woody, the former often spiny. The bases are overlapping, so closely packed and their sheaths so tightly wrapped about the stem that the removal of one of them is no slight matter, even when the trees are small. For taller palms the saw and clipper have to be mounted on a pole of suitable length. We used a sectional pole made of aluminum tubing jointed like a fishing rod, but of course much more rigid. With five

BOTANISTS WORK HARD

Here Dr. Hugh C. Cutler, Curator of Economic Botany, is using a curved saw at the end of a 25-foot pole to cut branches from palm, Copernicia gigas, in eastern Cuba on an expedition for the Museum.

four-foot lengths one can reach more than twenty-five feet, but this is not always enough. Occasionally we had to climb the tree or find a native professional tree climber to do this.

CARRIED BARRELS OF WATER

The specimens of the leaves and flowers were photographed to scale for a record of their original shape or measured and packed carefully. If the flowers were in the proper stage for examination and were growing vigorously, the microscope was used to study the formation of the pollen grains and to discover the number and kind of chromosomes present. Much of our work was done in the sandy savannas north of Camaguey, and during the abnormally rainless season the soil was so dry that flowers, long overdue, were not developing. To force some of the palms into activity we carried barrels of water and were able to stimulate the development of young flowers.

It was in this savanna area near Camaguey that we had found a hybrid palm growing in the same area as its parent species. This time we found many and could collect a complete series from one parent, with practically no leaf stalks, to the other parent, with leaf stalks nearly three feet long. For the shape of the leaf and many other characters we could find similar series from one parent through intermediates of all grades to the second parent species. Natural hybrids are occasionally found in many different groups of plants, but it is seldom that the hybrids form so large a part of the population. A similar phenomenon was later observed in a different mixed population of palms near the south coast of the island. Although we were able to study the palms of some areas in central and eastern Cuba and find species that we had not seen before, the discovery and study of the palm hybrids was the most interesting and botanically significant part of our trip.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

Forest Department, Georgetown, British Guiana—12 specimens of lumber, British Guiana; Botanical Museum, Harvard University, Cambridge, Mass.—135 herbarium specimens, Colombia; Museo de Historia Natural, Universidad Nacional de San Agustin, Arequipa, Peru—26 herbarium specimens, Peru.

Department of Geology:

H. O. Stockwell, Hutchinson, Kan.—a fragment of the Brenham meteorite (pallasite), Kansas.

Department of Zoology:

Douglas Tibbetts, Palatine, Ill.—16 mites and 7 sucking-lice, Illinois; Dr. Otto Schubert, Biologista de Estacaõ Experimental Pirassununga, São Paulo, Brazil—40 specimens of freshwater shells, Brazil; Harold Trapido, Gorgas Memorial Laboratory, Panama—95 frogs, lizards, and snakes, Panama and Puerto Rico; Chicago Zoological Society, Brookfield, Ill.—a newborn black cub bear; Museo de Historia Natural "Javier Prado," Lima, Peru—3 mammals (*Oryzomys*), Peru; Department of Wildlife Management, Agricultural and Mechanical College of Texas, College Station, Tex.—38 mammal specimens, Colorado.

MAKEE, A LEMUR FROM MADAGASCAR, LIKES CIVILIZED LIFE

By HARRY HOOGSTRAAL
ASSISTANT CURATOR OF INSECTS

(Mr. Hoogstraal recently returned from the University of California African Expedition, on which he was mammalogist-entomologist of the U. S. Navy Medical Science Group, on loan from this Museum.)

TO A ZOOLOGIST one of the most interesting features of Madagascar, the great island lying off the southeast coast of Africa, is the great number and variety of lemurs. Lemurs are the most remote living cousins of man and so have been of more than ordinary interest since they were first discovered. Lemurs of various kinds abound in Madagascar, where they were isolated in the geological past. True lemurs are found nowhere else in the world, although they are widely distributed as fossils.

"Makee," a lemur that I obtained in Madagascar, spent the first few days of his life riding on the back of his mother in the grotesque semi-desert forest of the southwest part of the island. Then his mother got trapped in a snare set by the Malagasy natives (in spite of an international agreement forbidding the killing of lemurs) and was shortly served up as a choice stew. The baby was too small for the natives to eat and was offered to us as a gift, but we were so delighted to receive him that we forced the princely sum of 60 cents into the hands of the donor. Soon the little animal became habituated to sleeping in bed, eating at the table, and riding in trucks and airplanes. He screamed in terror when he saw adults of his own species in the Tananarive zoo, but he knew exactly where to find the water tap on any DC-4 on the flight home.

AN IDEAL PET

I have usually taken a dim view of people who become overly fond of pets, but a baby of many of the species of "true" lemurs is irresistible. It is as curious as a monkey, but not destructive; as affectionate as a coati, but makes friends with anyone immediately; as clean as a cat, and does not attract fleas; as obedient as a dog, even though it has a strong will of its own; as playful as a kitten, and far more active. Our species, *Lemur catta*, known to the Malagasy as makee, is practically omnivorous in nature. In captivity it is surprisingly resistant to many diseases, except rabies (against which it can be inoculated), and is hardy under a great variety of conditions except cold weather.

Makee slept in my lap or leaned lazily against my arm for hours at a time in camp as I peered through the microscope examining the blood of his relatives and other Madagascar animals. When he thought that I had worked long enough, he forced his way to the eyepiece of the scope to have a look, too. Then he climbed about the rafters and roof of my thatched hut, chuckling, jumping, and hopping until I left my work to play with him. If I took him outside, he might crawl along the ground on his belly, head down and tail straight up like Pluto the Dog, following a chicken or a duck until he got within a few inches of the bird. Then he would take one swift swipe at the fowl's tail and run off at right angles, chuckling with mischievous glee. If a pugnacious duck took out after him, he climbed the stilts on which the huts were built and dared the antagonist to get him.

When I took him on excursions into the jungle, he hopped from tree to tree behind me. If I got too far ahead, he called for me to wait. If he got tired, he jumped onto my head and rode for a while and then hopped off for his exercise again. On long, hot hikes he performed his greatest service, for riding on my head he hung over my forehead and licked off the sweat before it ran onto my glasses or into my eyes.

"PALSY-WALSY"

For "Makee," the lemur, captivity means only the development of a beautiful friendship with Harry Hoogstraal, Assistant Curator of Insects, who brought the animal to Chicago after an expedition to Africa and Madagascar.

As guests of the French government in Madagascar, my companions and I were often invited to official dinners and receptions when we left the forest, and Makee was automatically included in the invitation. Until he reached America, where his hosts were far too indulgent, he conformed to a strict code of table manners. He might sit in one's lap with his hands on the table and eat anything on the plate, but putting his feet on the table was *verboten*. Walking across the table was a serious breech of etiquette, but walking along the edge of the table, from one diner to another, provided there were no deviations en route to sample a tasty morsel, was quite permissible. He relished bouquets of flowers so much that we had difficulty in restraining him from eating them when on a visit, but flowers were so plentiful that the hosts always urged him to eat his fill.

Mr. Robert Fernald, the American Consul-General at Tananarive, invited Makee to a dinner where he ate a good portion of his weight in lobster. Mr. Sidney Sober, the Vice-Consul there, invited him to a spaghetti dinner, at which the Consul ate one end of the long cords of spaghetti and the lemur ate the other end. Mr. William Bushwaller, the American Consul at Dar es Salaam, invited him to a cocktail party at which the little beast dragged the maraschino cherries out of the drinks and ate them on the white-leather covered furniture. My own mother here in Chicago, who makes the fabulous stories of a Dutch housewife's cleanliness sound like understatements, for the first time in my memory forgot about her chores for several days to play with Makee. In Washington he reduced admirals to grinning boys as he tugged at their hair, and at a Navy press conference he stole the show.

In nature, this species is a social, diurnal primate, traveling in bands of four to twelve or so, equally at home on the ground or in trees. At night the band sleeps high in trees, and on very dark nights lemurs seem to be quite blind. In captivity, they have a dread of being separated from human companionship and, although they do go

off in search of amusement in places where they are well acquainted, they come back at frequent intervals to make sure their foster parent is still around.

A ZEST FOR LIVING

When the day turns cool, the baby likes nothing better than to sleep in one's shirt, and at night when he curls up around one's neck he utters purrs of contentment and happiness for the first three or four minutes and then falls into a deep sleep. The sleep must be restful, indeed, for in the morning Makee races about, jumping, running, nipping, and chuckling with the happiness of being alive. Captive specimens have been known to live for twenty years, and while some adults bite (usually others than their special friends), others are known to remain gentle all their life. If not kept in too restricted a cage, this species often breeds well in captivity. Makee now is almost half-grown and weighs about a pound. His head and body measure about a foot and the tail about 18 inches.

Closely spaced, divided incisor teeth provide the lemur with a useful grooming comb, which he runs through his long, thick fur to keep it immaculately clean. Stroking or plucking or combing the little animal is immediately reciprocated by licking or running these teeth through his friend's hair. The process feels something like an inexpertly applied barber's clipper in operation. An additional grooming device is a claw on one of the toes, which is used for the grosser fur-cleaning operations. All the other toes and fingers are provided with small fingernails or toenails, which never need clipping.

Makee made friends with almost everyone who saw him, with only one exception. On the Capital Limited, en route from Washington to Chicago, we had a roomette, and the tired business man across the aisle fussed when he learned that an animal would be riding in the same car with him. Since the gentleman was also complaining because his roomette was at the end of the car rather than in the middle, his displeasure bothered me only slightly. On our record-breaking (I think) 79-hour flight from Tananarive, Madagascar, to Washington, D.C., a whole corps of Army sergeants and Navy CPOs took over the endless task of answering the never-ending standard questions—the same ones that I have attempted to answer above.

Makee is now living at the home of Curator of Anatomy D. Dwight Davis, in Richton Park, where his habits, actions, and growth will be the subject of close scrutiny and his antics will delight the family and whole community, if I am any judge of suburban life.

Museums Association Meeting

The 1949 annual meeting of the American Association of Museums will be held in Chicago May 19–21. Sections on education, children's museums, and science-museum technology will meet on Friday, May 20, both morning and afternoon, at Chicago Natural History Museum.

MOVIES FOR CHILDREN SATURDAY MORNINGS

The Spring Series of free motion picture programs for children will continue on Saturday mornings throughout April under the auspices of the James Nelson and Anna Louise Raymond Foundation. All of the programs begin at 10:30 and will be given in the James Simpson Theatre of the Museum. In addition to motion pictures, there will be lecturers on three of the programs.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

Following is an outline of the programs:

April 2—FROM POLAR BEARS TO PENGUINS

American animals from the Arctic to the Antarctic

Talk by Marie Svoboda

April 9—A MULTITUDE OF LIVING THINGS

Strange creatures of our native land—insects, crayfish, clams, and crabs

Talk by Lorus J. Milne

April 16—FLOWERS IN ACTION

Did you ever see a flower open, a plant eat or dance? These things are shown in these pictures taken by John Ott

Also a cartoon

April 23—STRANGE SEA ANIMALS

An octopus swims, a scallop walks, a barnacle waves in these color pictures of sea animals

Talk by Lorain Farmer

April 30—SPRING FEVER

Lazy days, warm sunshine, fishing, swimming, and adventures

Also a cartoon

Disabled Vets Visit Gem Room

The Museum was host on March 24 to a group of disabled veterans from Hines Hospital. These men, who are engaged in lapidary work at the hospital as occupational therapy, made a special request to the Red Cross for a visit to the Museum so that they could see the exhibits in H. N. Higinbotham Hall of Gems and Jewels. The Red Cross arranged for their transportation and for wheelchair attendants. The Museum provided a hostess, and members of the Department of Geology answered the veterans' questions. The tour was arranged by the Chicago Chapter, Red Cross Entertainment and Instruction Division.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The growth and progress of the Museum are astonishingly emphasized by the 50-year expansion of its staff in all departments. It is difficult to realize that the Museum could have been operated in 1898–99 by a staff of a dozen men. These were: Dr. Frederick J. V. Skiff, Director; Dr. George A. Dorsey, Curator of Anthropology; Mr. Stephen C. Simms, Assistant Curator, Division of Ethnology; Dr. Charles F. Millspaugh, Curator of Botany; Dr. Oliver C. Farrington, Curator of Geology; Mr. Henry W. Nichols, Assistant Curator of Geology; Mr. Elmer S. Riggs, Assistant Curator of Paleontology; Dr. Daniel G. Elliot, Curator of Zoology (except Ornithology); Dr. Seth E. Meek, Assistant Curator of Zoology (except Ornithology); Mr. Charles B. Cory, Curator of Ornithology; Mr. Juul Dieserud, Librarian; and Mr. David C. Davies, Recorder.

The Columbian Rotunda

To those of us familiar with Stanley Field Hall—with its long row of white columns and the Akeley elephants, which have become almost a symbol of our Museum—the main hall of the Field Columbian Museum of 50 years ago would seem strange indeed. The main floor of the old building in Jackson Park was (and still is) laid out in the form of a Grecian cross. From the Columbian Rotunda at the exact center of the building four great central courts radiated to the four points of the compass. The rotunda was devoted to an artistic memorial of Columbus and of the Columbian Exposition. In the center of the dome-covered rotunda stood a statue of the great discoverer, with uplifted sword consecrating the New World. Scattered about the rotunda were smaller statues depicting Truth, Strength, Liberty, Charity, and so on. Seventy of these satellite figures surrounded the imposing full-size statue of Columbus.

5 MORE SATURDAY LECTURES FOR ADULTS IN APRIL

The annual Spring Course of free illustrated lectures for adults will continue on Saturday afternoons throughout April. Five lectures remain to be given, all to begin at 2:30 P.M. in the James Simpson Theatre of the Museum.

Color motion pictures will accompany all but one of the lectures. Limited accommodations make it necessary to restrict the lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

April 2—COCONUTS AND CORAL
Alexander Spoehr

April 9—A MULTITUDE OF LIVING THINGS
Lorus J. Milne

April 16—JOURNEY TO JAPAN
Telford H. Work

April 23—A NATURALIST IN CHANGING NEW ZEALAND
Robert Cushman Murphy

April 30—ANTARCTIC ADVENTURE
Commander Finn Ronne

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

Comprehensive Indian Exhibits

The life of Indians is comprehensively covered in the Department of Anthropology. Five halls (Nos. 4, 5, 6, 7, and 10) are devoted to the aboriginals of North America, one hall is devoted to those of Mexico and Central America (Hall 8), and one to those of South America (Hall 9).

Southwest Botanical Expedition

Led by Dr. Hugh C. Cutler, Curator of Economic Botany, the Chicago Natural History Museum–Desloge 1949 Southwestern Botanical Expedition will leave April 15. Its purpose is to study plant populations in isolated moist areas in the dry Navaho country of northern Arizona and in adjacent Utah and New Mexico. At the same time, collections will be made of species of the Mormon tea plant, Ephedra, which is the dominant vegetation over large areas of the desert. The expedition is sponsored by Mr. Joseph Desloge, of St. Louis.

Students' Art Exhibit

Drawings and paintings by students of the Junior School of the Art Institute, many of whom do part of their classroom work and research in design and nature at Chicago Natural History Museum, will be exhibited at this Museum from May 4 to 31, inclusive.

STAFF NOTES

Dr. Rainer Zangerl, Curator of Fossil Reptiles, is on a study trip during which he will visit the Kansas University Museum, Texas Memorial Museum, U. S. National Museum, Yale Peabody Museum, and the Museum of Comparative Zoology at Harvard University. The purpose of this study trip is to examine type material and described material in these institutions and compare it with specimens, particularly the protosegid and toxochelyd turtle specimens, collected by the Alabama expeditions he conducted for this Museum. . . . **Mrs. Mary W. Baker,** Associate Librarian Emerita at the Museum, resigned her staff position at the end of March. Mrs. Baker came to the Museum as Assistant Librarian in 1930, became Associate Librarian on January 1, 1938, and became Associate Librarian Emerita on September 1, 1948, deferring her retirement until the present time. The best wishes of her many friends go with her. . . . **Mr. Rupert L. Wenzel,** Assistant Curator of Insects, will give the course at the University of Chicago in invertebrate zoology dealing with arthropods, in the absence of Dr. Thomas Park, who will be in England during the spring quarter. . . . **Dr. Julian A. Steyermark,** Associate Curator of the Herbarium, recently visited the U. S. National Herbarium, Washington, D.C., and the New York Botanical Garden to check plants in connection with the flora of Guatemala. . . . **Dr. Paul S. Martin,** Chief Curator of Anthropology, and **Mr. Donald Collier,** Curator of South American Ethnology and Archaeology, returned to the Museum from a study trip in Mexico during which they visited the principal archaeological sites and museums. . . . **Mrs. Anne Stromquist** has been appointed to the Raymond Foundation staff. She is a graduate of Hunter College in New York City, where her major work was geology. She has had training in art and was on the staff of New York Botanical Garden for three years as an artist. . . . **Mr. Karl P. Schmidt,** Chief Curator of Zoology, will introduce and comment upon a new British government film, based on the work of Darwin in the Galapagos Islands, at its presentation before the Chicago Scientific Film Society on April 13.

LECTURE TOURS IN APRIL DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., Apr. 1—Animals in Art. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Apr. 6—"There's No Place Like Home"—Housing Through the Ages (*Marie Svoboda*).

Fri., Apr. 8—Spring in the Woodlands—The Earliest Flowers, Leaves, Birds, and Reptiles. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Apr. 13—Bright Feathers—Bird Survey (*Jane Sharpe*).

Fri., Apr. 15—"Pride Goes to the Head"—Hats, Headdresses, and Hair-dos. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Apr. 20—"On Stage, Everybody"—The Universal Appeal of the Theater (*June Buchwald*).

Fri., Apr. 22—Master Farmers of the Andes—Primitive Agricultural Methods. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Apr. 27—Before the Dawn of History—Prehistoric Animals and People (*Lorain Farmer*).

Fri., Apr. 29—Trademarks of Cultures—Distinguishing Traits of Present-day Peoples. Illustrated introduction in Meetroom (*June Buchwald*).

NEW MEMBERS

(February 16 to March 15)

Associate Members

Claude A. Barnett

Annual Members

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BULLETIN
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Chicago Natural History Museum

Giant Model of

MALARIA MOSQUITO

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

'THE COW IS A MAMMAL, IT HAS SIX SIDES'

The following gem of original natural history observation is a 10-year-old's essay, "A Bird and a Beast," quoted by Sir Ernest Gowers in his book, *Plain Words*, prepared for the guidance of British civil servants whose duties include tasks of writing:

"The bird that I am going to write about is the owl. The owl cannot see at all by day and at night is as blind as a bat.

"I do not know much about the owl, so I will go to the beast which I am going to choose. It is the cow. The cow is a mammal. It has six sides—right, left, an upper and below. At the back it has a tail on which hangs a brush. With this it sends the flies away so that they do not fall into the milk.

"The head is for the purpose of growing horns and so that the mouth can be somewhere. The horns are to butt with and the mouth is to moo with. Under the cow hangs the milk. It is arranged for milking. When people milk, the milk comes and there is never an end to the supply. How the cow does it I have not realized, but it makes more and more. The cow has a fine sense of smell; one can smell it far away. This is the reason for the fresh air in the country.

"The man cow is called an ox. It is not a mammal. The cow does not eat much, but what it eats it eats twice, so that it gets enough. When it is hungry it moos, and when it says nothing it is because its inside is all full up with grass."

Sir Ernest's comment is: "The writer had something to say and said it as clearly as he could, and so has unconsciously achieved style."

OBITUARIES

Charles Henry Carpenter

Mr. Charles Henry Carpenter, Chief Photographer on the Museum staff for almost 50 years (from 1899 until his retirement on December 31, 1947), died April 12. He was nearly 90 years old. Mr. Carpenter was born October 20, 1859, at Granville, Ohio. He attended Denison University in his home city and worked for the Eastman Kodak Company before coming to the Museum. The Museum files contain many thousands of fine negatives that he made, both of material in the Museum and on field trips to the Hopi Indian Reservations, the home areas of Oklahoma Indians, and elsewhere. Examples of his work are familiar to all readers of the BULLETIN, the *Annual Report of the Director*, and the technical and popular books and leaflets published by the Museum Press.

Carl Gervens

Mr. Carl Gervens, a member of the staff of the Department of Botany, died April 8, at the age of 78. He had been employed at the Museum since 1924, beginning with the N. W. Harris Public School Extension, and in more recent years taking charge of plant mounting in the Herbarium. He was born in Germany.

Joseph Freeman

Mr. Joseph Freeman, Assistant Engineer at the Museum, died March 3. He had been employed by this institution since 1922. He was born August 30, 1882.

STAFF NOTES

Dr. Robert H. Denison, Curator of Fossil Fishes, made a reconnaissance trip to New York state last month to locate Devonian deposits for future work by the Department of Geology. His survey was principally in areas of the Catskill Mountains .... **Dr. Hugh C. Cutler,** Curator of Economic Botany, left on April 12 to conduct the Chicago Natural History Museum–Desloge Southwest Botanical Expedition. Mr. Joseph Desloge, of St. Louis, is sponsor of the expedition. Dr. Cutler will work in canyons within the area between Gallup, New Mexico, and Flagstaff, Arizona, collecting material for both the study collections and exhibits. His principal interest will be the joint firs or Ephedra .... **Mr. George I. Quimby,** Curator of Exhibits in Anthropology, has gone to Baton Rouge, Louisiana, to make a study of archaeological material that may become available to this Museum .... Mr. Quimby and **Dr. John B. Rinaldo,** Assistant in Archaeology, participated in the Upper Mississippi Valley Archaeological Conference at the University of Chicago .... **Dr. Paul S. Martin,** Chief Curator of Anthropology, is chairman of the resolutions committee, and **Mr. Donald Collier,** Curator of South American Ethnology and Archaeology, is chairman of the program committee for the meeting of the Society for American Archaeology to be held at Bloomington, Indiana, in May. Mr. Collier attended the meeting of the "C-14 Committee" at the University of Chicago, which discussed the dating of archaeological material by means of the radioactive isotope of carbon .... **Mr. Clifford H. Pope,** Curator of Reptiles and Amphibians, has returned from a field trip to Arkansas and Tennessee, where he engaged in studies of the salamanders of the southeastern United States .... The title of **Mr. Harry Hoogstraal** has been changed from Assistant Curator of Insects to Field Associate in Zoology.

THIS MONTH'S COVER

Our cover picture might well be titled "The female of the species is more deadly than the male," for it is the female anopheles mosquito that bites man and spreads malaria. Of the male it may be said his buzz is worse than his bite, for he feeds only on plant juices. This situation makes the female the more important of the two and therefore the one depicted in an elaborate enlarged model now exhibited in Stanley Field Hall of the Museum and reproduced on this cover. Magnified 25 times from life-size, this model has a body more than 10 inches long and is about two feet from tip of forelegs to tip of hind legs. What a task confronted Artist-Preparator James E. Trott in undertaking its construction (which called for meticulous scientific accuracy in accordance with Museum standards) may be realized in considering that the model is composed of 20,000 separate pieces, most of them tiny and individually fabricated, and that he spent the greater part of a year in this work. The mosquito is of the species sometimes known as "quad," abbreviated from the scientific name Anopheles quadrimaculatus. The giant model is made of various plastics, such as plexiglas, cellulose-acetate, and plastic dyes.

MALARIA MOSQUITO SHOWN IN GIANT-SIZE MODEL

By RUPERT L. WENZEL
ASSISTANT CURATOR OF INSECTS

A distinguished addition to the reproductions of plants and animals for which Chicago Natural History Museum is noted is the series of mosquito models that was recently placed on temporary exhibition in Stanley Field Hall. The four models, which represent the life history of the common malaria mosquito of North America, are twenty-five times natural size. They were executed by

'TRY THIS FOR SIZE'
Artist-Preparator James E. Trott with the giant anopheles mosquito model, creation of which represents almost a year's working time.

Mr. James E. Trott, Artist-Preparator in the Department of Zoology. The common malaria mosquito, known technically as *Anopheles quadrimaculatus*, is the most important and one of the most widely distributed carriers of malaria in the United States.

The models constitute part of a series prepared for an exhibit on mosquitoes and malaria that will be installed in Albert W. Harris Hall (Hall 18) at a later date. However, it was felt that they were of such great intrinsic interest that it would be desirable to display them alone in a conspicuous place before installing them in the permanent exhibit. The exhibit on mosquitoes and malaria is one of a series to be prepared in continuation of plans for the insect hall.

Because of the complex external structure of insects, it is necessary for the artist thoroughly to understand insect anatomy if he desires to produce life-like models. Thus, the unusually detailed and scientifically accurate mosquito models are of special interest to both the zoologist and the layman. Before beginning work on a model, Mr. Trott made detailed studies, drawings, and color notes from living and preserved specimens as well as from published descriptions and illustrations. As work progressed on a model, comparisons were continually made with living material.

The eggs (*see cut*) were cast in celluloid. The bodies of the other models were carved from plexiglas; the surface scales and bristles are reproduced in celluloid or other plastics, or are represented by mammal hair. The larva and pupa were carved and painted from within to reproduce the internal organs that ordinarily are visible from the outside. The model of the adult mosquito (*see cover picture*) is made of more than 20,000 separate pieces, including scales and bristles. A little more than a year was spent in making the four models of this series.

The Army Medical Department Research and Graduate School, the United States Public Health Service, and the Illinois State Natural History Survey generously cooperated in supplying living and preserved specimens as they were needed.

METAMORPHOSIS SKETCHED

The eggs of anopheles mosquitoes are laid in loose groups on the surface of still water and have air cells that serve as floats. They hatch in two to four days and the larvae or "wrigglers" emerge. These have special "float hairs." They feed on microscopic organisms during the one to two weeks of the larval stage. When fully grown the larva changes into a pupa or "tumbler," which is active but does not feed. This stage lasts two to three days, during which the adult mosquito forms; then the pupal skin splits and the adult emerges and rests on the water surface until its wings and body harden, when it flies off to mate and feed. The female apparently must have a blood meal before its eggs can develop properly, which accounts for a great deal of discomfort experienced by human beings as well as actual danger of disease. The adults usually live from ten days to two weeks, but some may live several months.

MODELS OF ANOPHELES MOSQUITO EGGS
In the exhibit they are magnified 25 times; in the illustration above approximately 18 times.

YOUNG ART STUDENTS DISPLAY CREATIONS

Beginning May 4 and continuing through May 31 there will be a special exhibit in Stanley Field Hall of thirty-six selected pictures in a variety of media—chalk, crayon, water colors, and oils—produced by students of the Junior School of the Art Institute of Chicago. These students, ranging from 8 years through high school age, are enrolled in various classes that for many years have availed themselves of natural history exhibits as subjects for painting and design and of classroom facilities through co-operative arrangements of the Art Institute and Chicago Natural History Museum. The paintings as a whole display imaginative treatment in composition and the use of color. They were chosen on the basis of relative excellence and are representative of the accomplishment of different age groups and different types of working materials. The Museum's part in offering its facilities for this field of study is only one of the many and widely varied kinds of educational activities in which the institution engages.

LECTURE TOURS IN MAY, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., May 4—Bag and Baggage—Travel Equipment in Many Lands (*Harriet Smith*).

Fri., May 6—Snake Stories. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., May 11—Medicine Men—Primitive Medical and Dental Practices (*Marie Svoboda*).

Fri., May 13—Superstitions. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., May 18—Courtship in the Animal World (*Lorain Farmer*).

Fri., May 20—Burial Customs (*June Buchwald*).

Wed., May 25—Flowers as Symbols—Use of Flowers to Express Ideas (*Miriam Wood*).

Fri., May 27—Life in the Water. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement, special tours are available to groups.

'How to Win Wrens and Influence Pewees' . . .

WAYS TO ATTRACT BIRDS TO LIVE IN YOUR GARDEN

By ELLEN T. SMITH
ASSOCIATE, DIVISION OF BIRDS

BIRDS are fascinating. They always have been and I suppose they always will be. Each year more and more bird enthusiasts in the United States buy more and more bird houses, feeding stands, window feeding trays, bird glasses, and wild-bird seed, not to mention canaries, lovebirds, parrots, and other cage birds, with all the paraphernalia necessary to their well-being. Many bird books go into several large editions and the sale of books on birds reaches phenomenal proportions.

The Museum telephone is kept busy by people asking questions about birds, their habits, and how to attract certain species. A new exhibit, recently installed in Hall 21, answers some of these questions by demonstrating different methods of attracting birds on small city lots as well as in the country. All of the birds shown in this exhibit are year-round residents of the Chicago region.

RESIDENT BIRDS OF CHICAGO

New exhibit in Hall 21, prepared under the supervision of Mrs. Hermon Dunlap Smith, Associate in the Division of Birds. In addition to typical bird inhabitants of this area, the exhibit shows devices for attracting, sheltering, feeding, and providing water for birds.

350 SPECIES NOTED HERE

More than 350 species of birds have been seen in the Chicago region at one time or another. About 200 of these are common, 110 uncommon or rare, 38 are accidental or no longer occur in this area, and two, the passenger pigeon and the Carolina paroquet, are extinct. Approximately 37 species, ranging from common to rare, live within a 50-mile radius of Chicago throughout the year and so form our permanent resident bird population.

The dividing line between permanent residents and seasonal residents is not always clear, as in the case of robins and bluejays. Robins are essentially summer residents of the Chicago region. A few stragglers are seen each winter, but they usually appear to be rather unhappy at having stayed behind. Bluejays, on the other hand, though essentially migratory, seem able to adapt to the cold weather, and when food and shelter abound, the same individuals remain in the neighborhood year after year.

The four basic requirements of all birds are water, food, nesting sites, and cover, the last three of which can be supplied by intelligent planting and careful planning.

WATER PROVISION

Water is as essential to most birds as it is to people, and when no natural source is at hand it can be supplied in flower-pot saucers, bird baths, and pools, and in dry weather even by sprinklers or a slowly running hose. Birds like to bathe as well as to drink; so for the sake of their health the smaller the receptacle the oftener the water should be changed.

In winter, glycerin added to the water will delay freezing and should be renewed at least daily. Better than this, a water supply can be heated at slight expense by a kerosene lamp burning low. Best of all, water boxes similar to that in the exhibit now can be bought for $11, equipped with weatherproof extension electric cord and a thermostat to keep the water at a 45-degree temperature. The box is covered to keep the birds from bathing in freezing weather. The water must be replenished two or three times a week because of evaporation and use.

A continuing natural food supply for birds the year around can be achieved by careful planting. There is a large amount of literature on this subject. Many pamphlets and books contain tables of the quality of each food plant, its season, the amount of protection it provides, and its suitability for nesting sites. Some also tell the ornamental values of the plants and their cultivation requirements. Several list the various species of birds most likely to be attracted by each plant. Study of one or more of the pamphlets listed at the end of this article is recommended before planting for food, nest sites, or protection.

The exhibit in Hall 21 shows a few plants that may be used advantageously even on small lots. In nearly every case, for each plant shown there are three or four others that could be used instead. A notable omission is the birch family, well known for its late winter and early spring food supply at a time when little else is available.

ARTIFICIAL FOOD SUPPLY

The artificial feeding of birds, especially in winter, gives enjoyment to increasingly large numbers of bird lovers in city and country alike.

Emergency feeding, such as that undertaken temporarily during ice storms, will save the lives of countless numbers of birds normally living on natural food supplies. But artificial feeding generally implies attracting birds to a window or near a home where they can be watched and enjoyed all winter.

Seed-eating birds readily come to ordinary wild-bird mixture, containing sunflower seed, wheat, buckwheat, milo, hulled oats, canary seed, red and yellow millet, and crushed peanuts. Extra sunflower seeds may be added, or a row of sunflowers can be planted near-by. Corn is omitted because it attracts crows, jays, and grackles, which drive away smaller birds, but it is helpful in attracting gamebirds, such as quail and pheasant, in parts of the Chicago region where these birds occur.

Insect-eating species will come to suet or beef fat, tied to branches or tree trunks or held in suet racks. Wooden suet racks are desirable in all areas where the temperature drops at any time during the winter to zero or below. On these days the feet and even the tongues of birds may be severely frostbitten by the use of metal or wire suet racks. (In the spring, try filling suet racks with bits of string, wool, or suitable nesting material. You will be well rewarded.)

CAUTION RECOMMENDED

Artificial feeding should be started early in the fall, and once the birds have been encouraged to spend the long winter in the neighborhood, nothing should interfere with the regularity of the feeding. Do not start if you cannot see it through until the spring insects return and the trees are in bud. If you contemplate taking a short winter trip,

Pamphlets on Birds

5 CENTS EACH FROM SUPT. OF DOCUMENTS, GOVT. PRINTING OFFICE, WASHINGTON, D.C.:

U. S. Dept. of Interior, Conservation Bulletin No. 1—*Attracting Birds.*

U. S. Dept. of Agriculture, Farmer's Bulletin No. 912F—*How to Attract Birds in the East and Central States.*

U. S. Dept. of Agriculture, Farmer's Bulletin No. 1644—*Local Bird Refuges.*

U. S. Dept. of Agriculture, Farmer's Bulletin No. 1456—*Homes for Birds* (including how to make them).

10 CENTS EACH FROM MORTON ARBORETUM, LISLE, ILL.:

Morton Arb. *Bulletin*, Vol. 5, No. 10—*Shrubs Whose Fruits Are Attractive to Birds.*

Morton Arb. *Bulletin*, Vol. 16, No. 4—*Birds at the Morton Arboretum.*

25 CENTS FROM THE NATIONAL AUDUBON SOCIETY, 1005 FIFTH AVE., NEW YORK:

Song-Bird Sanctuaries. Some of the plant material listed thrives better in the East than in Chicago area. Obtainable at The Museum Book Shop.

FIELD IDENTIFICATION GUIDES, FOR SALE AT THE MUSEUM BOOK SHOP:

Land Bird Guide, by Chester A. Reed—$1.75.

A Field Guide to the Birds, by Roger Tory Peterson—$3.50.

Field Guide of Eastern Birds, by Leon Augustus Hausman—$3.75.

Birds of the Chicago Region, by Ford, Sanborn and Coursen—$0.50. Published by Chicago Academy of Sciences. Lists birds and arrival and departure dates.

OTHER BOOKS HIGHLY RECOMMENDED:

A Guide to Bird Watching, by Joseph Hickey—$3.50.

The Audubon Guide to Attracting Birds—Doubleday, Doran, & Co.—$2.50.

Birds in the Garden and How to Attract Them, by Margaret McKenny—originally $5. Reprinted in full at $2.98.

Invitation to Birds, by Virginia S. Eifert. Free to residents of Illinois on application to the State Dept. of Registration and Education, Springfield.

use some of the self-filling types of feeders pictured in the exhibit. An inverted quart jar full of bird seed with a small outlet into a dish at the base, protected from raiding squirrels, should maintain an unbroken food supply for four or five days. Use as many as necessary. Suet cakes last sometimes as long as a week or ten days and can be bought with imbedded seeds that will be relished by seed-eating birds if the regular supply fails. No one would care to be in the cruel position of having made birds dependent on a food supply that fails at the crucial moment, leaving them to starve or to become so hungry that they are numbed by cold and eventually freeze to death.

NESTING SITES

In our gardens and near our homes it is customary to remove dead trees and dead branches and often to fill cavities in trees that we wish to save. This practice, although it may be aesthetically necessary, removes most of the nesting sites of flickers, downy woodpeckers, bluebirds, chickadees, and other residents of holes in trees. In most cases this can be remedied by supplying nesting boxes suited to the individual species, as for instance, the tiny screech owl, one of our most desirable birds.

All bird houses should be made with provision for opening and should be cleaned every winter. Any painting should be done in the fall. Martins, in particular, do not like the smell of fresh paint.

PROTECTION SUGGESTIONS

Bird baths and feeding stations should not be too near heavy bushes in which cats or other enemies can hide and wait to seize the birds as they come to drink or to bathe and feed. A distance of five or six feet is generally considered safe enough in the Chicago region. Small gardens can be enclosed by cat-proof fences, although these are unsightly from the outside, as they cannot be hidden by trees or tall bushes, which obviously would render them useless.

It is remarkable how much use is made by birds of a little protection. A barberry hedge, a clump of bushes, a small brush pile, an evergreen tree or ground cover, all are utilized for escape from enemies as well as inclement weather. When these are augmented by our native trees, there is no place, even in the center of a city, that will not boast its bird population.

SPECIES IN NEW EXHIBIT

The resident birds shown in the new exhibit are: sparrow hawk; quail; screech owl; four woodpeckers—the hairy, downy, red-bellied, and the flicker; prairie horned lark; bluejay; crow; cedar waxwing; chickadee; titmouse; nuthatch; starling; English sparrow; cardinal; goldfinch; and song sparrow.

THE MUSEUM'S OWN "QUIZ KIDS"

Some of our younger Museum visitors are demonstrating how to go about acquiring a museum education in a methodical, well-organized way that leaves the staff in a state approaching awe.

For over a year Raymond Foundation guide-lecturers have come to look forward to the presence of from three to a dozen of the same ten to twelve-year-old boys on Museum tours every Saturday and school holiday. Their technical questions leave the adults on the tour speechless, and, when the word gets around that our "quiz kids" are in the building, the lecturer braces herself for a "tough tour." Her problem is to keep the explanations "*down* to the *adult* level" of understanding and scientific background. And every tour stimulates an avid interest that keeps the librarians busy for the rest of the day.

Several weeks ago their spokesman, Eddie, came proudly to the Raymond Foundation office to announce that the boys considered themselves a Museum club and would like to arrange for a group tour on the subject of prehistoric life and evolution—they'd been studying up on it. These youngsters know just what they want from the Museum's storehouse of knowledge and how to go about getting it.

HARRIET SMITH
Raymond Foundation

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

GEOLOGY—"Assistant Curator Elmer S. Riggs, and H. W. Menke as photographer and general assistant, were dispatched to a field near Medicine Bow, Wyoming, where three months were devoted to collecting fossil reptile remains in the Jurassic beds of that region. While it is yet too early to judge accurately of the material obtained, there is no doubt that the results will be highly satisfactory and that much has been secured along a line hitherto entirely unrepresented in the Museum. About five tons of bones in the matrix have been shipped. . . ."

FOSSIL HUNTERS ON DRESS PARADE

Former Curator of Paleontology Elmer S. Riggs on white horse and Mr. Howard W. Menke in wagon on an expedition to Medicine Bow, Wyoming, in the 1890s. Today Museum expeditions use motor carry-alls, trucks, cars, and even airplanes.

George M. Pullman, a Corporate Member and one of the benefactors of the Museum, died in 1899. Pullman Hall (Hall 13), named in his honor, is familiar to most visitors to the Museum, with its display of game animals.

NEW MEMBERS

(March 16 to April 15)

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Julian H. Levi

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Book Vandalism . . .

ART DILETTANTES PERIL HISTORY OF BOTANY

By VALMERE REEVES
DEPARTMENT OF BOTANY

HAVE you ever seen an advertisement such as this?

> "Sale of lovely old flower prints. Here is your chance to secure something valuable and beautiful that will add color and charm to your home. These old prints are becoming scarce; so take advantage of this opportunity. Come in today."

It looks innocent enough, but behind it is an unfortunate story. More often than not these lovely flower prints have been cut from one of the fine botanical books

FANCY PLUS NATURALISM

Copperplate engraved frontispiece from Nicolaus Joseph Jacqui's book "Illustrations of Selected American Plants—Selectarum Stirpium Americanarum Icones," published in 1763. Note the exact representation of the many newly discovered plants from the New World.

of that one hundred years (1740–1840) which was the golden age of flower illustrations. There has been no other period when so much real artistic talent was engaged in illustrating plants. No wonder these prints are in demand as decorative art treasures, but it is unfortunate that, because of the demand, many books important in the history of botany have been and are being destroyed.

Let us look at the chain of history to discover why the flower paintings and prints of this period are of such excellence. We may trace the story in the books of the Botany Library here at the Museum.

Originally, people were interested in plants supposedly beneficial in treating human ailments. It was of these plants and the superstitions and symbolism connected with them that they wrote. The few pictures dating from this time were highly stylized and decorative rather than illustrative of the text. Down through the ages they served as patterns of hand-written manuscripts. The copying and recopying to which they were subjected often degraded them to decorations that no longer resembled plants.

REALISM ENTERS

The invention of printing in the 15th century soon brought a new type of plant illustration. At first printed books were patterned after manuscripts and the illustrations were still hand drawn. Before too many years had passed, woodcut illustrations came into being. The first of these (1460) were just rough copies of the pictures found in old manuscripts. With few exceptions these old conventional patterns remained in use until about 1530, when their inadequacies became apparent and artists finally turned to nature itself for their material. Botanical books of that period show a marked improvement because their pictures are more realistic and serve to illustrate the text. This advance in book illustration of all kinds came as soon as artists realized that drawing for wood engraving was worthy of their talents. Artists such as da Vinci and Dürer pointed the way with their fine naturalistic drawings, and botanical illustrators soon followed their lead.

At the end of the 16th century new printing methods were developed, bringing about further notable changes, especially engraving on metal plates. The first botanical book containing prints made from metal plates was printed in Naples in 1592. Fabio, the author, had etched his drawings on copper plates. This method of etching and engraving was well suited to good botanical illustration because much finer lines could be drawn and thus truer and more concise delineations of delicate plants could be made than with woodcuts. There was also less chance of error in engraving illustrations on metal plates, as the artist often did both the drawing and etching or engraving rather than have an artist draw a picture, another man copy it onto the wood block, and a third do the cutting.

SUPERB ARTISTRY

This new method of reproduction and the advances that followed, such as lithographic printing and multicolor printing, were further incentives to good artists, since reproductions could really do justice to their original drawings or paintings. While some of the early woodcuts had been hand-colored and many had been executed in excellent style, they frequently lacked accuracy. But once real artists began working on book illustration, much superb work was published. The fine quality attained in those hand-colored engravings and lithographs cannot be caught today even with our refined methods of color photography.

In addition to these advances in methods of reproduction and the growing interest of many good artists in this field of endeavor, several other developments took place about this time, making the period from 1740 to 1840 one of much renown. Many people became interested in natural history and created a great demand for illustrated books about plants. Botany had slowly divorced itself from medicine and was becoming a science in its own right. Plants were no longer of interest merely for their value in curing people's ills. In short, modern science was coming into being. People were alive to their world.

Rapid progress was made in many fields and this period witnessed the founding of many scientific societies, museums, and botanic gardens that fostered the growing interest in plants. Often these societies or some private individual financed the printing of books in which they were interested, many of them on botanical subjects. Numerous explorations in foreign lands and many new plants introduced as a result also left their mark. Titles such as these abound: *Plants of the New World*, *Descriptions of New Plants*, *Exotic Plants*, *Flora of New Holland*, *Flora of French Guiana*, and *Flora of Chile and Peru*.

ADOPT LINNAEAN SYSTEM

Perhaps the greatest single influence on botany of this period and thus on the books written was Linnaeus' *Systema Naturae* (1732). A flood of books followed, all making use of the system he had expounded for naming and classifying plants. The title page of the first number of Curtis' *Botanical Magazine*, the oldest of its kind, exemplifies the attitude of the people of that time. The magazine was for those who "wish to become scientifically acquainted with the plants they cultivate." The "most ornamental foreign plants" were to be "accurately represented in natural colours" and "their names, class, order, generic and specific characters" told "according to the celebrated Linnaeus." The setting in history was right for the large number of very fine floral prints that soon followed.

BY SOWERBY

Example of best flower illustration—a copper engraving in Curtis' Botanical Magazine, published in 1787.

James Sowerby, Ferdinand and Franz Bauer, George Ehert, S. T. Edwards, W. H.

Fitch, R. K. Greville, J. N. Mayrhoffer, Pierre Joseph Redouté, Pierre Jean Turpin—these are some of the artists whose names you may find next time you have the opportunity to inspect flower prints. It is their fine work that is today indirectly responsible for the destruction of historically important books.

The *Botanical Magazine*, first issued in 1787 and still published today by the Royal Horticultural Society, has employed a long list of fine artists. The names of James Sowerby, J. Curtis, S. T. Edwards, W. H. Fitch, and others appear in fine script on its flower portraits. The first plates in the *Botanical Magazine* were copperplate outlines that were hand colored. Then came lithographic hand-colored illustrations. These early plates belong to that period, the products of which are now in such demand as art pieces. Many of these prints were the work of James Sowerby, one of the first illustrators. Flower painting was much taught at the time and he, through painting flowers, had become interested in botany and studied it. Thus he was well qualified for his fine work.

Most of the people who did flower illustration were not really botanists, although some author-botanists illustrated their own works. Outstanding among them is Sir William Jackson Hooker, one of the most illustrious English botanists of the 19th century and for a period director of Kew Botanical Gardens. Bauer, Edwards, Fitch, and Greville also illustrated for him.

A leading artist of this period was the young German, Ehert, who illustrated Linnaeus' *Hortus Cliffortianus* (1732). This work was commissioned by the rich burgomaster of Amsterdam and represented an inventory of his botanical garden. It became quite fashionable for nobility and wealthy benefactors of botany to have their gardens catalogued and illustrated.

MARIE ANTOINETTE A PATRON

The name of Pierre Joseph Redouté is perhaps the most famous among flower illustrators. His more than 6,000 pictures adorn books by de Candolle, Bonpland, Michaux, L'Héritier, Lamarck, and others. He is probably most esteemed by nonbotanists for his rose portraits in *Les Roses* (1817) and for *Les Liliacées*, containing lily portraits. Marie Antoinette and Empress Josephine both were his patrons. He became a flower painter only after the botanist L'Héritier had seen his exquisite work and persuaded him to specialize as a botanical artist. Great accuracy and beautiful coloring characterize his work.

After Redouté the golden age of flower illustration drew to a close. The events and circumstances that had brought about this period through wide popular interest in science, the impetus given by Linnaeus' system of naming, the introduction of many new plants from foreign lands, and the stage of development of printing, culminated roughly with the development of modern photography. New, rapid, and cheaper methods of printing were introduced and soon made fine books with handsome illustrations available to more and more people. With all advantages in their favor, however, the illustrations of today have not yet gained the same art value as those of the age when great artists painted flowers.

Visiting Hours Change May 1

Beginning May 1, summer visiting hours, 9 a.m. to 6 p.m., will go into effect until September 5 (Labor Day).

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Miss Nivvie G. Mallory, Chicago —an Indian mortar, Nebraska.

Department of Botany:

From: Dr. José Calienas Rodriguez, Universidad Nacional de San Agustin, Arequipa, Peru—26 herbarium specimens, Peru; Pioneer Hybrid Corn Co., Johnston, Ia.—400 ears of corn from commercial and test plantings, Iowa; Donald Richards, Chicago —630 specimens of algae, New Brunswick, and 100 cryptogams, Japan; Señor Raul Arrazágola, Buenaventura, Colombia—15 boards of Colombian woods.

Department of Geology:

From: R. E. Gammell, Chicago—2 trilobites, Pennsylvania.

Department of Zoology:

From: Harry Hoogstraal, Chicago—128 reptiles and amphibians, 39 fishes, and 39 fresh-water shells comprising four species, Africa; Col. Clifford C. Gregg, Valparaiso, Ind.—14 reptiles and amphibians, 55 moths, butterflies, and beetles, and a yellow bat with young, Africa; Dr. Henry Field, Washington, D.C.—391 reptiles and amphibians, East Africa; Dr. E. C. Williams, Jr., Crawfordsville, Ind.—123 lots of sawbugs and earthworms, Barro Colorado Island, Canal Zone; Walter Buchen, Chicago —a snake, Africa; Dr. Hans Schlesch, Copenhague-Bispebjerg, Denmark—2 kinds of fresh-water shells, Denmark; W. E. Eigsti, Hastings Museum, Hastings, Neb.—10 beaver parasites and 11 bird lice, Nebraska; Dr. Don L. Frizzell, Rolla, Mo.—3 shells of a rare marine mollusk, Ecuador.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; Philosophical Publishing Co., Beverly Hills, Quakertown, Pa.; Augusto Morales y Sanchez, Director, National Park and Botanical Gardens, Tegucigalpa, Honduras; Mrs. Emily M. Wilcoxson, Lombard, Ill.; Karl P. Schmidt, Homewood, Ill.; Maj. Howard Wright, Orlando, Fla.

MUSEUM OFFICIALS GROUP TO MEET IN CHICAGO

Work in which Chicago Natural History Museum has been one of the pioneers—the use of plastics in preparation of exhibits—will be discussed and demonstrated by Mr. Emil Sella, Curator of Exhibits in Botany at this Museum, before the Science-Museum Technology Section of the 1949 annual meeting of the American Association of Museums.

The association is meeting in Chicago, May 19 to 21, inclusive. Both its morning and afternoon sessions on Friday, May 20, will be held at Chicago Natural History Museum. The Education Section will meet in the James Simpson Theatre, the Children's Museums Section in the Lecture Hall, and the Science-Museum Technology Section in the Meeting Room. The Museum Superintendents Section will meet informally on a tour to be conducted by Mr. James R. Shouba, Chicago Natural History Museum Superintendent, and Mr. Francis J. McCabe, superintendent of the Art Institute of Chicago. All these sections will attend a luncheon in the Museum Cafeteria. Sessions of the other days will be held at the Art Institute of Chicago, Chicago Historical Society, Chicago Academy of Sciences, and Science and Industry Museum.

GIRL SCIENCE 'STAR'

A special feature arranged for members of the association will be the display of a miniature diorama of Southwest Basket Maker Indian life, made by Miss Vorsila Laurene Bohrer, 18-year-old winner of one of the 40 awards in the nation-wide Eighth Annual Science Talent Search conducted for Westinghouse Science Scholarships by Science Clubs of America (administered by Science Service, Washington, D.C.). Miss Bohrer is a resident of Prospect Heights, suburb of Chicago, and attends Arlington Heights Township High School. There were 16,218 contestants. Miss Bohrer's diorama portrays pre-Pueblo culture at a period when the cultivation of corn, building of homes, and making of pottery took the place of a nomadic life.

For the general public, this diorama will be exhibited May 1–31 in an alcove of the ground floor north corridor.

Technical Publications Issued

Botanical Series, Vol. XIII, Part III, No. 2. *Flora of Peru.* By J. Francis Macbride. March 18, 1949. 269 pages.

Fieldiana: Geology, Vol. 10, No. 6. *A New Genus of Taeniodonts from the Late Paleocene.* By Bryan Patterson. March 31, 1949. 2 pages. $0.10.

Fieldiana: Zoology, Vol. 31, No. 26. *Distribution and Variation of Caprimulgus Maculicaudus.* By Emmet R. Blake. March 31, 1949. 8 pages. $0.10.

UNDERWATER ORCHID

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

Most people think of orchids as large showy flowers worn in corsages or displayed at flower shows or in florists' windows. Orchids are usually visualized as coming only from plants perched high on trees in steaming, hot, tropical jungles. Little is it realized that orchids represent one of the largest families of flowering plants, with flowers that range in size from minute and inconspicuous to showy and spectacular

ORCHID FOR THE AQUARIUM
Flower of Spiranthes odorata, "underwater orchid."

and that vary in all shades of colors. The plants themselves may grow in all parts of the world and all kinds of climates, from sea level to mountain top, from desert to rainforest. Their roots may grow in the soil or over bare rocks or high up in the tree tops, dangling and exposed to the air. All are orchids, however, by virtue of a similar type of flower structure.

Yet, it may be a mild shock to learn of an orchid that actually grows under water. Many persons who have known of some wild orchids growing in swamps and wet places still never heard of any growing submerged in water. What, then, is this orchid? What kind of plant is it?

USED AS AQUARIUM PLANT

The story is quite simple. A number of years ago, Mr. Albert Greenberg, of Tampa, Florida, prominent dealer in water plants and tropical fishes, sent to the Museum a specimen of an orchid that he called "underwater orchid." It was identified by the writer and later verified by Mr. Charles Schweinfurth, orchid authority at Harvard's Botanical Museum, as "fragrant ladies' tresses" (*Spiranthes odorata*). Mr. Greenberg was especially interested in this orchid because he had been using it as an ornamental aquarium plant in his large establishment where thousands of water plants are grown in connection with the tropical fish industry.

The natural habitat of this orchid in Florida, according to Mr. Greenberg, is in shaded swampy woods that remain flooded from three to five months of the year. Many of the plants observed were growing along the edge of streams in leaf mold and among fibrous tree roots. Occasionally some were observed to have been washed into the streams and to have established themselves where the current was not too fast. In the latter habitat these plants actually grew larger and better leaves than those at the swampy edges or in flooded land.

SUCCESSFULLY PROPAGATED

On finding submerged plants like these, Mr. Greenberg tried propagating them as aquarium plants. That he has been successful in his endeavors is testified by the fact that specimens of the same plant have been kept under water for more than three years. When the plant gets ready to bloom, a long narrow flower stalk, bearing at its top a column of several ranks of tubular, waxy, white flowers, is sent up between the rosette of light green, strap-shaped leaves. The stalk may start below the surface of the water, but the actual flowering part with the flower buds always projects above the water level. Sometimes even a small broken-off portion of a root, which has become detached and allowed to float to the surface of the water, may produce a new plant. Thus, this orchid can be reproduced even by vegetative propagation.

This case illustrates how under the influence of man a plant can extend its environment and adapt itself to an extreme habitat, where it might otherwise not grow for long. Of course, many swamp plants can adapt themselves to prolonged periods of submergence and remain indefinitely under such circumstances in a submerged leafy state of growth. Other plants ordinarily growing submerged in water temporarily can adapt themselves to land conditions when the water dries up or droughts occur. The case of this orchid is noteworthy, however, since it is so different from other members of the orchid clan. Other species of the ladies' tresses group (*Spiranthes*) often grow in wet meadows, fields, stream banks, and ledges, but many of them grow in fairly dry situations, such as dry upland woods, exposed sunny rocks, or even in desert regions. In the case of the underwater orchid (*Spiranthes odorata*) we note an ability to adapt to extreme aquatic conditions. It is a southern species of the coastal states, ranging from Virginia to Florida and west to Texas.

Geographical distribution of poisonous snakes in the United States is the subject of an exhibit in Albert W. Harris Hall.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

HISTORICAL GEOLOGY. By Carl O. Dunbar. John Wiley & Sons, Inc., 1949. 567 pages, illustrated with 350 photographs. Price $5.

Historical Geology by Carl O. Dunbar is a worthy successor to the *Textbook of Historical Geology* by the late Charles Schuchert and Carl O. Dunbar. The present volume is an outgrowth of the preceding publication, not merely a revised edition. The alterations, additions, and deletions that have been made are far more numerous than are usually found in a work of revision.

A considerable portion of the text has been rewritten and many of the illustrations are new. Dr. Dunbar has never lost sight of the progress that earth sciences have made, nor has he failed to take account of such progress. Not only has he retained the objectives of the earlier volume, but he has introduced a great many features to insure presentation of the subject matter—the birth and development of the earth—with greater clarity.

The sequence of events, both physical and biological, is manifest; there are no abrupt breaks or jumps in the arrangement. The prologue has been recast and the geologic time scale has been placed in a more orderly setting. The introduction of a new, enlarged set of paleogeographic maps, with greater detail, is a major feature and a very welcome supplement. Regardless of how generalized a paleogeographic map may be, there is no other medium that provides a clearer conception of the extent of ancient lands and seas.

Some readers, perhaps many, will miss the correlation tables that have been omitted. That they are "too technical for the student and inadequate for the teacher" may be true; nonetheless, the value of such tables as a handy general reference can hardly be gainsaid.

This reviewer does not know of any textbook in which the earth's history has been more comprehensively surveyed or where the principles of interpretation of events of the past have been so well developed and co-ordinated. The book should serve, as before, not only as an excellent college text but also as a book for all professional geologists who have occasion to deal with historical geology in their routine work. Laymen interested in the origin and history of the earth will find this an easily read and understandable book providing adequate and authoritative information.

SHARAT K. ROY
Chief Curator of Geology

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Chicago Natural History Museum

SOUTHWEST 'DIG'

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

'Poll' of Ancient Housewives . . .

A NEW METHOD TO TRACE ARCHAEOLOGICAL DATES

BY JOHN B. RINALDO
ASSISTANT IN ARCHAEOLOGY

A "poll" that won't be contradicted by later returns—because it's a poll of people who are not only dead but have been dead from about 1,000 to 5,000 years—has recently been made by archaeologists on the staff of the Museum. This was a poll to ascertain the preferences of prehistoric housewives for particular kinds of pottery vessels. The housewives were those of the extinct Mogollon tribe of Indians that lived in what is now New Mexico.

The purpose of the poll was to determine dates of various periods of ancient culture. This new method of dating was devised by Dr. Paul S. Martin, Chief Curator of the Department of Anthropology, and the writer. It was applied to artifacts excavated by expeditions to the Southwest led by Dr. Martin and is reported upon in a book, *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico*, just issued by the Museum Press. The book, a report of this poll and other results of the 1947 Southwest Archaeological Expedition, was written by Dr. Martin, Dr. Ernst Antevs, Research Associate in the Department of of Geology, and the present writer.

The report describes an ancient Cochise camp site, three later pit-house villages, and a small town, resembling an apartment house in form, built of stone. Also described are the tools, pottery, and utensils of the people who formerly lived in these places. There is a chapter by Dr. Antevs on the dating of the Cochise artifacts from the earliest site and a chapter on methods of excavation by Mr. George I. Quimby, Curator of Exhibits in Anthropology. The sites reported on are representative of stages in cultural development in this area from about 3000 B.C. up to about A.D. 1000, although there remained gaps in the line of development to be filled in by subsequent investigations.

The use of the poll or new method of dating devised by the authors is an important part of the report because it is an axiom that "methods of dating are the backbone of archaeology." This does not necessarily mean that the digger into the past is interested only in the kind of dates the school boy learns so reluctantly, such as 1066 or 1492. If the archaeologist cannot determine the calendar dates for the ruins in which he is digging, he asks himself the question, "Which is the earliest, which the next earliest, which the latest?" In this instance, because of the lack of tree-ring dates, the authors were faced with the problem of determining which one of two pit-house villages, basically much alike, was lived in earlier.

HOW 'POLL' WAS TAKEN

The method of dating they devised was the so-called poll. It was known that a style of pottery vessels with polished exteriors was a later style than one with vessels that had rough exteriors. First a count was made of the different kinds of pottery from each house. Then the tallies for the various houses were arranged in a column with the counts at the bottom of the column for those houses whose occupants liked the old styles better and, at the top, the counts for those that had changed over to the new. Thus it was determined not only which site was the earlier but also which houses of the two sites were the earliest and which the latest. It is as if we had concluded that a house in ruins in one of our own cities was earlier than another house because there were more old-fashioned cast iron and copper pots and pans and fewer new-style aluminum and glass kitchen utensils in the first than in the second house.

A similar comparison was made of the architecture of the houses at the earlier village. These houses were arranged in the same order that they appeared in the pottery column and it was found that there were three groups of houses representing three distinct styles of architecture. For example, there was an increase in the number of floor storage-pits from early to late, and each group had a different type of entrance.

By an extension of this method, similar trends were also found in the frequencies of the different types of tools these people used. For example, certain types of milling stones were used more frequently in later times and others more frequently in earlier times. Thus the trends in pottery and in house and tool styles checked against each other and provided a more refined and detailed picture of changes than would have been possible otherwise.

THIS MONTH'S COVER

As related elsewhere in this BULLETIN, the 1949 season of the Museum's Southwest Archaeological Expedition will begin in June. The cover picture, taken in a previous season, gives an idea of how a large expedition of this type conducts one of its extensive "digs." Shown is the excavation of an early Mogollon pit house that dates to about A.D. 500, as it appeared from the expedition's 20-foot photographic tower during final operations on this particular site. A close examination of the picture will reveal prehistoric human skeletons, buried in pits and around the edge of the house. Burials and entrances were orientated to the east, apparently indicating a tribal ritual based on sun worship. Stone tools and other artifacts recovered by the archaeologists from the floor are shown around the site. The trench in the background is an exploratory one—a number of these must be essayed before a fruitful site is uncovered.

Two Contributors Elected

Two names were added to the roll of Museum Contributors (*a membership designation for those who contribute between $1,000 and $100,000 in money or materials*) at the meeting of the Board of Trustees held May 16. The new Contributors are Mr. John W. Moyer, Chief of the Motion Picture Division of the Museum, who was elected in recognition of his gifts of natural-history specimens, books, and motion-picture films, and Mrs. L. Byron Nash, of Highland Park, Illinois, who has presented valuable Polynesian ethnological specimens.

Brother Léon (Joseph S. Sauget y Barbier) of the Museo de Historia Natural del Colegio de La Salle, Vedado, Havana, Cuba, was elected a Corresponding Member of the Museum. (*Corresponding Members are scientists or patrons of science, residing in foreign countries, who have rendered eminent service to the Museum.*) Brother Léon is the greatest living authority on the flora of Cuba. He has repeatedly assisted various expeditions from the Museum.

Southwest 'Dig' . . .

EXPEDITION TO RESUME HUNT FOR TRACES OF EARLY MAN

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY

THE Southwest Archaeological Expedition of Chicago Natural History Museum will leave for New Mexico early in June to continue research and excavations.

(Dr. Paul S. Martin, the writer, is leader of the expedition, and Dr. John B. Rinaldo, archaeologist on the Museum staff, his assistant. The 1949 project is the fifteenth in the series of Southwest expeditions of this Museum and the twenty-sixth in Dr. Martin's career. Dr. Ernst Antevs, Research Associate in Glacial Geology, will be attached to the expedition part of the time, as in past seasons, and will assist in determining dates for the material excavated. Ten or more local residents will be engaged to assist in digging operations.)

Five of the previous field seasons were spent in the same general area in which this year's party will work—Pine Lawn Valley. In this area, located in west central New Mexico about 100 miles north of Silver City, the earlier expeditions uncovered much information concerning the genesis of the little-known Mogollon culture.

Pine Lawn Valley was chosen for archaeological activity because: (1) no previous archaeological work had been done there; (2) several villages, on the basis of surface indications, were judged to be representative of the earlier Mogollon horizons; (3) no one had (up to 1939) excavated any "pure" early Mogollon villages; (4) traces existed there of many other villages occupied between A.D. 500 and 1400; (5) the valley seemed to show a rather long occupation, which, if true, would yield a greater sequence of cultural history than ever before obtained for the Mogollon culture or for that area; (6) the valley was somewhat isolated and therefore the towns were less exposed to "foreign" or "outside" influences; and (7) it was provided with an ideal climate, topography, flora, and fauna for the origin and development of small villages. This last point is emphasized because a clearer idea of past sequences of events can be obtained and more satisfying deductions concerning culture changes can be made if small settlements are studied.

ANCIENT HEARTH BARED

The thrill of archaeological discovery is illustrated by this photograph from a past Southwest Archaeological Expedition, showing Dr. Ernst Antevs, glacial expert, pointing to evidence of prehistoric man found five feet below the surface at Wet Leggett Canyon, the oldest site in New Mexico uncovered by Museum archaeologists in recent years.

NEW VISTAS OPENED

The five previous seasons have yielded information beyond expectations. We now have a better understanding of the Mogollon culture because of our researches.

Up to 1934, all prehistoric civilizations of the Southwest had been classified as belonging to either the Anasazi (Pueblo) or the Hohokam cultures. In 1934, Dr. Emil Haury, then of Gila Pueblo, Globe, Arizona, and now Chairman of the Department of Anthropology, University of Arizona, excavated two villages that certainly did not fit in with any previous notions concerning Southwestern civilizations. He therefore published his results and called his new find the "Mogollon culture"—named after the near-by Mogollon Mountains. But no one knew at that time anything concerning the origins or growth of this culture.

Nothing more was done toward solving this problem for several years, and Haury's hypotheses concerning a "new culture" were not generally accepted. Many believed that the material he found and described was merely a curious variation of existing cultures.

In 1939, we started our work in Pine Lawn Valley in an effort to throw more light on Haury's hypotheses. Our researches have verified and strengthened Haury's hypotheses, and further discoveries were made. We now have a growing body of evidence to support the Mogollon hypothesis and feel that the concept of a Mogollon culture is better established.

CULTURAL ORIGIN TRACED

PAUL S. MARTIN
Expedition Leader

As a result of the various attacks made upon the Mogollon problem, we now know that this new culture probably grew out of a very ancient non-pottery culture that is called Cochise. Cochise culture is one of the earliest in the New World.

The history of Pine Lawn Valley, as a result of our excavations, may be briefly summarized as follows:

About 5,000 years ago, during a dry cycle, some Cochise Indians were forced to leave their pleasant Arizona habitat because it was gradually becoming dryer and therefore less desirable. Some of the Cochise people wandered into our Pine Lawn Valley in their search for water. They found and camped on a streamlet fed by a spring that still flows today.

These people stayed in the valley and later (perhaps about A.D. 200) borrowed the idea of constructing pit houses, a house type that was used for several centuries in that area. The excavation of one of these is shown on the cover of this BULLETIN. The type of stone tools used by the Cochise people remained in fashion until A.D. 500 or later. Gradually better pit houses were built and better pottery was made.

REMAINING GAPS TO FILL

There are many gaps in our knowledge, but this summer we hope to fill some of these. We are going to try to find out what happened (1) between 3000 B.C. and A.D. 200 and (2) between A.D. 700 and A.D. 1000. We know that at about A.D. 1000 people or culture elements (surface houses with masonry walls, black-and-white pottery) penetrated the area. Why this happened we do not know, nor do we know where these new traits came from.

Finally, we wish to know when the valley was last occupied, why it was abandoned, and where the Mogollon people went. These inquiries are very broad and cannot all be investigated this summer. But if we are aware of the problems and if we have broad, extensive aims, we shall be less likely to miss important information as it is revealed in our excavations.

The Bird Page . . .

IVORY-BILLED WOODPECKER VERGING ON EXTINCTION

By ELLEN THORNE SMITH
ASSOCIATE, DIVISION OF BIRDS

Mr. Robert Burton of Chicago recently gave the Museum a pair of ivory-billed woodpeckers, a species probably extinct or on the verge of extinction in the United States. The separately mounted male and female are in excellent condition and were

IVORY-BILLED WOODPECKER
Specimen on exhibition in Hall 21. The species is in danger of becoming extinct.

shot by Mr. Burton's grandfather, Henry W. Burton, of Carlinville, Illinois. Mr. Burton used to hunt deer in the St. Francis River country of Arkansas, where he shot these birds about 1870 and had them mounted. They have been in the possession of the family since then, and Mr. Robert Burton, realizing their value and importance, decided that they should find permanent housing in Chicago Natural History Museum.

RIVER BOAT SOUVENIRS

It should be noted that in spite of name and color, the bills are not real ivory but are horn, a fact not generally realized. When the first Mississippi steamboats stopped for wood fuel, passengers paid 25 cents for two or three heads. In later years, mistaking the bills for genuine ivory, as much as five dollars for a bird's bill changed hands, a goodly sum for those days.

An early reference to the ivory-billed woodpecker was made in 1731 by Mark Catesby, who says that their bills were much prized by Indians, who made crowns of them, points outward, for their chiefs and great warriors. "Northern Indians, having none, purchased them from southern Indians for 2 and sometimes 3 buckskins for each bill." Belts of chiefs were also closely ornamented with both crests and bills of the bird, whose dried head was supposed to give to an Indian the woodpecker's power of seeking out and capturing prey and of cutting a big hole in its enemy. A calumet (peace pipe) decorated with six or seven ivory bills is in the near-by Public Museum of Milwaukee.

The ivory-billed woodpecker is (or was) a bird of the cypress swamps and moss-hung oak and sweet-gum forests of the South. In former times it was found throughout the Gulf states and as far north as North Carolina and up the Mississippi Valley to southern Ohio and Illinois, where Audubon saw it in 1831. He nicknamed it "Van Dyke" because of its neat, dignified black-and-white plumage and its red crest. The female's crest is entirely black.

As civilization spread and the roadless wilderness diminished, the ivory-billed woodpecker became more and more rare, until in 1926 it was believed to be extinct in the United States. A larger species exists in Mexico and a smaller one in Cuba, both also becoming increasingly rare. However, in 1930–32, a few ivory-bills were found in South Carolina, southern Florida, and central Louisiana, where detailed studies were made of the bird and its habits. The last authentic pair disappeared from the Singer Logging Tract of Louisiana in 1942, and all subsequent reports of ivory-bills, when followed up, have proved to be mistaken ones based on the pileated woodpecker. The pileated woodpecker, although a large bird, is 3 or 4 inches smaller than the ivory-bill and is fairly common in large forests in many parts of the United States. One notable difference is the presence of a distinctive large white back-patch in the ivory-billed woodpecker.

A clue to the disappearance of the ivory-billed woodpecker may be found in its feeding habits. It lives almost entirely on the borers and beetle larvae that abound *between* the bark and the sapwood of newly dead trees. Its large pointed bill is really a chisel for stripping off the bark, so that its long extending tongue can reach and spear the borers. Trees long dead and even some living trees have borers *inside* the sapwood and heartwood, where they are dug out by the pileated woodpecker but seldom by the ivory-bill. Recently dead trees in abundance are found only in rare spots, such as in the wake of hurricanes or on burnt-over land and also on the site of logging operations. The ivory-billed woodpecker is a strong flier, traveling in pairs (they mate for life) from one forest catastrophe to another. In such places it strips the bark completely from a recently dead tree, leaving it in piles around the base of the tree. With the completion of logging operations in many southern areas, the enormous amount of food required each day by this big bird is so reduced that it is probably extinct now in the United States, except possibly for a few stray individuals.

PLEASE NOTIFY MUSEUM IF YOU GO AWAY

Members going away during the summer may have Museum matter sent to their temporary addresses.

TRAVELING BIRD'S NESTS

By AUSTIN L. RAND
CURATOR OF BIRDS

IN SPRING and fall many of our birds make long journeys under their own power, some of the most publicized being the migration of the Arctic tern, a bird that may spend the northern summer north of the Arctic Circle and, before returning there next season, may have visited south of the Antarctic Circle. The golden plover that makes a non-stop flight to Hawaii is another famous traveler, and many of our smaller song birds are no mean travelers either. The barn swallow that nests about an Illinois farm in the summer may spend the winter in Argentina. The tiny hummingbird's feat of crossing the Gulf of Mexico non-stop is worthy of mention, too. Such travels have become commonplace through familiarity. We have come to accept even the possibility of trans-Atlantic passages of occasional small passeres, helped by trans-Atlantic vessels,

Cartoon by Emily Huss

and of such birds as starlings making their way from place to place by boxcar.

But when it is time for birds to make their nests and rear their family we expect them to give up their traveling for a time and to settle down in one place. We expect, with our song birds, to have the male arrive first, pick out a territory, and announce to his species that other males are to keep out and that a mate is welcome. The female arrives and chooses her mate or his territory, and a nesting ensues. Many species defend the area around the nest against others of their kind. So it comes as a surprise to find nests built in such a situation that they are not stationary but move back and forth, along with part of their environment.

Tree swallows nest on the ferryboats that ply between Ogdensburg, New York, and Prescott, Ontario, across the St. Lawrence River where it is more than a mile wide. The nests are tucked into suitable openings on the ferries, and the frequent trips back and forth across this mile of water and the docking at different piers do not seem to disturb the birds. They gather their nesting material of feathers and straws and leaves from either shore, and when the young are being fed, insects may be gathered about the Canadian or the United States shore, depending on where the ferryboat is docked.

Barn swallows have been noted nesting on railway trains that run across the two-mile portage between Atlin Lake and Carcross on Lake Marsh (in Yukon Territory). In the summer the train makes the trip almost daily, and for many years a pair, or a succession of pairs, has made its nest and raised its young in one of the open baggage cars. Members of the train crew have taken an interest in the birds and put up a cigar box for a safe place for their nest. Here the family seems to prosper, undisturbed by the proximity of people and baggage and the clatter as well as the movement of the train.

STAFF NOTES

Colonel Clifford C. Gregg, Director of the Museum, has been elected a member of the Council of the American Association of Museums. The Council is the governing board of the association.... **Dr. Paul S. Martin,** Chief Curator of Anthropology, **Dr. Alexander Spoehr,** Curator of Oceanic Ethnology, **Mr. George I. Quimby,** Curator of Exhibits, **Mr. John B. Rinaldo,** Assistant in Archaeology, and **Miss Elaine Bluhm** of the anthropological staff attended the annual meetings of the Society for American Archaeologists and of the Central States Branch of the American Anthropological Association held jointly at Indiana University in Bloomington, May 13–14. Mr. Quimby was elected president of the second-named group. Dr. Martin was elected a member of the Executive Committee of the archaeological society. Dr. Spoehr presented a paper on "Kinship Types in Micronesia."... Chief Curator Martin will lecture before the School of American Research in the Museum of New Mexico at Santa Fe on June 10. He will tell the results of the Museum's Southwest Archaeological Expeditions and present a motion picture of the "dig."... **Mr. Donald Collier,** Curator of South American Ethnology and Archaeology, attended the annual meeting of the Division of Anthropology and Psychology of the National Research Council in Washington, D.C., May 13–14.... **Mrs. Meta P. Howell,** Museum Librarian, was a speaker before the Librarians' Section of the meeting of the American Association of Museums held at the Oriental Institute in Chicago last month. Her subject was "Exchanges of Publications."... **Miss Miriam Wood,** Chief of the Raymond Foundation, spoke on "Teaching Botany to Children" before the Children's Museum Section at the annual meeting of the American Museums Association held in the lecture hall of this Museum May 20.... **Mr. Karl P. Schmidt,** Chief Curator of Zoology, was chairman of the organization meeting of the Committee for Research of the Chicago Zoological Society, held in the Museum recently. **Dr. Alfred E. Emerson,** of the University of Chicago, who is a Research Associate in Insects at the Museum, was one of those present together with Mr. Clay Judson, Mr. Robert Bean, Director of the Chicago Zoological Society, and Prof. Smith Freeman, of Northwestern University.... **Mr. Loren P. Woods,** Curator of Fishes, gave a lecture for the Department of Zoology at the University of Illinois recently.

Museum Officials' Meetings

The Children's Museums Committee for the United States of the International Council of Museums, a division of the United Nations Education, Science and Culture Organization (UNESCO), held a meeting, attended by delegates from many cities, at Chicago Natural History Museum on May 18.

The May 20 sessions of the American Association of Museums meeting (May 19–21) were held at this Museum.

Noted Entomologists Here

Dr. Elwood C. Zimmerman, Associate Entomologist, Hawaiian Sugar Planters' Association, and Curator of Entomology, Bernice P. Bishop Museum at Honolulu, spent a day at the Museum in May. Dr. Zimmerman is en route to the British Museum (Natural History) to complete work on butterflies, moths, and nerve-winged insects of Hawaii.

Other distinguished entomologists who visited the Museum last month were Dr. Joseph C. Bequaert, Curator of Insects, Museum of Comparative Zoology at Harvard College, and Dr. Cornelius B. Philip, Senior Entomologist, Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Montana.

The bower-birds, rather close relatives of the gorgeous birds of paradise, go in for psychology in their courtship. Instead of depending on his plumage, the male builds an elaborate bower and dances on its decorated platform to charm his bride (see Case 19 in Stanley Field Hall).

LECTURE TOURS IN JUNE, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., June 1—Races of Mankind (*Lorain Farmer*).

Fri., June 3—The Adventures of Carl Akeley. Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., June 8—Defense Weapons of Animals (*Jane Sharpe*).

Fri., June 10—Plants and Animals of Illinois. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., June 15—The Land of the Mummies (*June Buchwald*).

Fri., June 17—Summer Hobbies—Exploring the Out-of-Doors. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., June 22—Toys (*Harriet Smith*).

Fri., June 24—Parade of the Insects. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., June 29—Our Daily Bread—Plants of Economic Importance (*Marie Svoboda*).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement, special tours are available to groups.

NEW MEMBERS
(April 16 to May 14)

Associate Members

Walter S. Baltis, Dr. John A. Bigler, N. Newton Inlander, Robert J. Koch, A. W. Lavers, Richard M. Loewenstein, A. E. Meyerhoff, Vincent P. Reilly, Mrs. Barrett Scudder.

Annual Members

Otto Bissel, Morton Bodfish, Harold Brady, A. D. Bruce, Harley N. Bruce, C. L. Casey, Claude T. Clark, Thomas J. Corcoran, Dave Edelson, Miss Frances C. English, Sheridan E. Farin, Sidney M. Fields, James H. Finlay, C. P. Fisher, Arthur H. Hagg, Herbert Harig, LeRoy B. Herbst, Mrs. George P. Hollingbery, Dr. Paul Joseph, Mrs. Marion O. Kane, Stanley B. Levi, Carl S. Lloyd, Philip Lyons, Kenneth McBurney, Rev. Thomas J. Megahey, Thomas G. Murdough, Edwin A. Murray, George B. Pletsch, William G. Rambeau, H. T. Riedeman, Harlow P. Roberts, Alan S. Robinson, Hugo R. Scala, Werner W. Schroeder, Dr. Steven P. Schwartz, Ross D. Siragusa, Raymond A. Smerge, Mrs. Francis R. Stanton, William Scott Stewart, Edward F. Toepper, Ralph R. Trimarco, C. A. Wells, Preston Zimmerman.

ZOOLOGICAL EXPEDITION FLIES TO SIAM

An expedition to make a survey for the Museum of the little-known animal life of peninsular Siam, financed and led by Mr. A. Rush Watkins of Chicago, got under way last month. Members of the party met in San Francisco, whence they flew for Bangkok, the Siamese capital, on May 17. Mr. Watkins is accompanied on the trip by Colin Campbell Sanborn, Curator of Mammals, and Frank C. Wonder, Staff Taxidermist. At Bangkok the party was joined by resident collectors familiar with the local fauna.

A. RUSH WATKINS

The expedition plans to make general collections of the fauna of peninsular Siam, a region of heavy forests and continued rainfall. Material from this area will serve to round out the Museum's Asiatic collections from China and French Indo-China. It is hoped that there will be an opportunity to collect specimens of the Malay tapir for a habitat group in William V. Kelley Hall (Hall 17—Asiatic Mammals). In addition to mammals, the expedition will make collections of birds, fishes, reptiles, insects, and certain botanical specimens. Material from this Asiatic country is found in few museums of the United States, being best represented in the United States National Museum in Washington, D.C., and the Philadelphia Academy of Sciences.

COLIN C. SANBORN

In Siam, the expedition's travel in the interior will probably be chiefly by small native boats or on the backs of elephants. The party will be in the field from early June until sometime in September. The expedition, flying via Pan American World Airways System, made stops in Honolulu and Manila en route to Siam.

When work in the field is completed, Mr. Sanborn will fly to Singapore and London. He will make studies at the Raffles Museum and the British Museum (Natural History) to identify the mammals collected and to continue his special studies on bats. On his return to Chicago he will have flown completely around the world. Mr. Watkins and Mr. Wonder also will return via London and New York.

In the past, Mr. Watkins has been an enthusiastic private collector and has presented the Museum with valuable collections of small coastal fishes from Mexico.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

From: Dr. John L. Blum, Buffalo, N. Y.—55 specimens of algae, Pennsylvania; Dr. Chester S. Nielsen and Dr. Grace C. Madsen, Tallahassee, Fla.—423 specimens of algae, Florida; Dr. Walter Kiener, Lincoln, Neb.—144 specimens of algae, Nebraska and Colorado; University of California, Berkeley—63 specimens of algae; Dr. Richard Evans Schultes, Beltsville, Md.—158 herbarium specimens, Colombia and Brazil; U. S. National Museum, Washington, D.C.—10 specimens of fossil Metasequoia.

Department of Geology:

From: H. O. Stockwell, Hutchinson, Kan.—a small slice of the Norcatur meteorite, Kansas.

Department of Zoology:

From: Dr. Harald Sioli, Belem, Pará, Brazil—301 land and fresh-water shells, Amazon region, Brazil; Chicago Zoological Society, Brookfield, Ill.—a turtle and 7 turtle eggs; Lieut. John F. Kurfess, U. S. Navy—7 worm snakes, Guam; Lincoln Park Zoo, Chicago—a baby Anoa; U. S. Fish and Wildlife Service, Washington, D.C.—5 fishes, Florida and Texas; Walter J. Eyerdam, Seattle, Wash.—89 land and fresh-water shells, South America; Fr. A. DeCooman, Shanghai, China—21 Histerid beetles of the genus Abraeus (5 species), Indo-China; Rev. A. Buch, Ningpo, China—16 moths, 13 fireflies, a butterfly, and 3 waterbugs, China; Dr. José O. Nolasco, Culion, Palawan, Philippines—2 lots of parasites of the dugong, Philippines; Albert R. Mead, Berkeley, Calif.—2 frogs and 2 lizards, Nigeria; Harold Trapido, Panama City, Panama—3 crocodile skulls, Chagres River, Canal Zone; Sr. Eduardo Acosta y Lara, Montevideo, Uruguay—2 bats, Uruguay; Brother Niceforo Maria, Pamplona, Norte de Santander, Colombia—4 bats and a squirrel, Colombia.

Library:

From: Dr. René Bourret, Hanoi, Indo-China; Dr. Henry Field, Washington, D.C.; Col. Clifford C. Gregg, Valparaiso, Ind.; Karl P. Schmidt, Homewood, Ill.; A. C. Hinton; and the American Dental Association, Boardman Conover, William J. Gerhard, and Paul C. Standley, all of Chicago.

Fruiting branches of damson plum and blackberry are among the more recent additions to the synoptic exhibit of flowering plants in Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29).

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The cheetah group is one of the series resulting from the late Carl E. Akeley's first African expedition in 1896, with Dr. D. G. Elliot, the Museum's first Curator of Zoology. The stimulus derived from this expedition resulted in Akeley's tremendous burst of activity that produced a large number of the groups still exhibited in the Museum's Carl E. Akeley Hall of African Mammals (Hall 22).

AFRICAN CHEETAH GROUP

Mounted and installed in 1899 by the late Carl E. Akeley. Now on exhibition in Akeley Hall (Hall 22).

From the 1899 Annual Report of the Director:

Expeditions and Field Work.—Each department of the Museum has performed valuable work in the field during the year [1899]; valuable not alone as a contribution to science, but valuable to the Museum as regards the new material obtained thereby. The following is a list of the expeditions of the Museum since the date of the last report:

West Indies, C. F. Millspaugh, Plants; Pacific Coast, S. E. Meek, Fishes, reptiles, etc.; Southern Illinois, G. A. Dorsey, Quarry shop material; Wyoming, E.S. Riggs, Fossils; Winona Lake, Ind., S. E. Meek, Fishes; Medicine Co., Calif., G. A. Dorsey, Ethnological material; Puget Sound, G. A. Dorsey, Ethnological material; Vancouver Islands, G. A. Dorsey, Plaster casts.

Technical Publications Issued by the Museum

Fieldiana: Zoology, Vol. 31, No. 27. *Bats of the Genus Micronycteris and Its Subgenera.* By Colin Campbell Sanborn. April 29, 1949. 20 pages, 9 text figures.

Fieldiana: Zoology, Vol. 31, No. 28. *Land and Fresh-Water Mollusks from Peru.* By Fritz Haas. April 29, 1949. 16 pages, 10 text figures.

Fieldiana: Anthropology, Vol. 38, No. 1. *Cochise and Mogollon Sites, Pine Lawn Valley, Western New Mexico.* By Paul S. Martin, John B. Rinaldo, and Ernst Antevs. April 29, 1949. 232 pages, 78 text figures.

AFRICAN 'NATURE BOYS'

By WILFRID D. HAMBLY
CURATOR OF AFRICAN ETHNOLOGY

IN THE summer vacation the would-be "nature boys" appear in full strength—they are the wishful thinkers en route to the wide open spaces of forest and prairie. There they hope to be freed from the shackles and strain of city life. In strange garb they appear, hampered with heavy leather boots laced up to the knee, the better to combat rattlers, swamps, and thorn bush.

The accoutrements may include a cap with ear-flaps, a lumberjack's shirt of startling design, and a stout belt that shelters a murderous sheath knife. In place of the log on which primitive man navigated lake and stream we see a well-equipped rubber boat, while bow and arrow have been replaced by the lethal rifle and shotgun.

THE HUNT
Sketch by a native artist encountered by Dr. Hambly in Africa.

"Nature boys" are very widely distributed and the writer made contact with many of them during the Frederick H. Rawson Expedition to West Africa for the Museum.

NATURE LORE AND EMPTY STOMACH

Preparation for African tribal life, and above all the demonstration of ability to support a wife, are grim and earnest fundamentals of the training given to boys in Negro tribes. It is not for a vacation that youths reaching puberty assemble with tribal elders in a secluded part of the bush, but the ordeals through which these novices pass are not so formidable as might appear at first glance. One must remember that almost from infancy the novices, now twelve to fifteen years of age, have roamed the countryside, juniors under the tutelage of seniors.

From the initiation camps, boys are released every day to provide their own food. Out they go to plain and forest, probably after a chilly night spent naked on the ground within their compound. They are empty handed but rich in ideas. Every boy knows how to make snares and traps. He can recognize the kinds of wood suitable for his bow and arrows. He is expert in making fire by friction, and if lucky enough to find a nest of wild bees he will make short work of smoking them out and obtaining the honeycomb. In the nesting season the eggs of wild birds will be added to his larder. He can fish successfully with a line of bark to which a sharp blade of grass is attached in the form of a hook. There is little fear, therefore, that he will go hungry to bed, though this may occur if the elders regard the catch as particularly appetizing.

The old men may decide to give their pupils a lesson in self-denial. Under these circumstances the boys are expected to polish their empty wooden platters vigorously, meanwhile chanting "kuku-kuku"—thank you, thank you; and let there be no suggestion of irony in the tone, for the old men know well how to take care of impudence. The idea of cheating, by consuming part of the food during the gathering and hunting, would naturally occur to any intelligent boy. But the old men are also astute, and they thoughtfully provide a guardian for each pair of boys. From the time the novices leave camp to their return they are under a watchful eye.

GENUINE 'NATURE BOYS'

If an anthropologist working in Portuguese West Africa decided to organize a nature ramble, say among the Ovimbundu tribe (though many African Negro tribes would serve as well or even better), his first choice would rest with the professional hunter *Ukongo*, the medicine man *Ocimbanda*, and a few boys of teen age.

Ukongo on account of his highly specialized training is superior in skill and knowledge to spurious "nature boys," and every African village has many such who hope to secure game as much by luck as good judgment. When a boy, the professional hunter was taken to the sacred house of bows, where he made contact with spirits of dead hunters who gave their blessing on his training. He in turn poured libations of beer over the weapons that decorated the interior of the hut, and so his success became a matter of spiritual contact as well as natural ability and training.

The hunter considers himself fortunate if he has a muzzle-loading gun with a wide smooth bore. From a leather pouch he takes a handful of small scrap iron obtained from the village blacksmith. This he rams down the barrel and secures by pushing in a wad of cloth or bark. The powder is carried in a small horn. The "kick" on firing is terrific, and a white hunter (not the writer) who was well used to modern rifles suffered severely from a bruised jaw and shoulder. But more probably the hunter carries a long bow and a quiver of arrows tipped with iron points. Some tribes poison these tips with vegetable matter or by sticking the points in a putrid carcass.

The boys carry arrows with blunt wooden points; these are used for shooting birds. Some member of the party is likely to have an iron-tipped spear for throwing, and another carries a wooden club with a heavy knob. This he can hurl with great accuracy at a nimble hare or a large bird flying near the ground.

As we ramble along through wooded country one of the boys is busy making a cone-shaped trap of cane. It is about 24 inches long, closed at the pointed end, and left with a three-inch round opening at the wide end. The trap is placed in a patch of dry grass which is fired with flint and steel borrowed from *Ukongo* the hunter. He needs this for igniting the gunpowder that fires his gun.

Soon the patch of grass is ablaze, but the trap is made of material which does not easily catch fire. So the grass patch is reduced to ashes, and with cries of delight the boys take from the trap three field mice. This is the first contribution to supper. But other items quickly add to the menu. One boy has found a bird's nest and is carefully removing the eggs. They may have been set for days, but the presence of an embryo chick and a high flavor will make them the more acceptable.

One boy is taking a kind of mucilage from a small box and smearing the substance on

PRIZED MUZZLE-LOADER
Ovimbundu tribesman of central Angola with ancient gun obtained from Portuguese.

branches of trees. On the return journey, or perhaps tomorrow, he will return in the hope of finding small birds ensnared. He particularly hopes to snare a small yellow bird, for he has made a cage of wicker. The feathered prisoner will be cared for, and the boy will carry the cage about with him. He will sit in the shade with his caged pet nearby and listen to the twittering.

UKONGO BECOMES TALKATIVE

Men do not as a rule chatter with the hunter, whose night journeys and lonely vigils have made him a thinker rather than a talker. Yet suddenly he opens up with a flash of interest. "Look," he cries, "there goes the little bird Onduva whose bright feathers are used for decorating the head of a dead king." He glances far afield and quite seriously points out a bird who "tells us when a stranger is nearing the village," and close to him is a bird whose call becomes shrill and insistent when rain is about to fall. Here *Ocimbanda* the medicine man chimes in. "I like to hear the call of the rain bird," he says, "for then I can safely perform my magic to make rain and the people will not be disappointed."

The hunter suddenly gives a shrill cry: "Take care boy! Don't climb along that branch. Can't you see a thin green snake waiting there to catch a bird."

Then transferring his attention to the trees he calls the boys, "See! over there is the tree whose berries can be made into sticky lime to snare the birds, go and gather them." *Ukongo* takes out his knife and as he cuts thin strips of wood he explains, "This is the tree *omanda*, the wood is springy, I must make myself a new bow." One of the boys, son of a blacksmith, helps himself to a large piece of wood that will yield charcoal for the smithy. The boys too seem to be well informed. They know the timber that is used for houses and bridges because it resists the attack of termites. And they are quick to recognize the barks that can be made into string, rope, and even clothing.

THE LEOPARD TRAP

Ukongo holds up a warning hand, and all fall silent as we make our way to a clearing in the bush. There we see a structure of strong logs, a little log cabin with a sliding door. The hunter goes on hands and knees carefully examining the ground for leopard tracks. But he gives a cry of anger when he sees that the sliding door is a foot above ground. He is right, the trap is empty. The leopard had vigorously gulped the meat inside the trap and in so doing jerked the string that held up the door. The heavy beams started on their downward journey but stuck in the grooves, and the leopard was able to squeeze under the door. This *Ukongo* explains with profound disgust, but soon he is busy setting the trap again, using as bait a hunk of goat flesh.

And now the boys are having a lesson in driving pointed stakes into the ground. The spoors show that antelope jump a thicket and land on the other side. Tomorrow when they leap, the deadly points will transfix them, so *Ukongo* hopes, and he will visit the spot daily until his patience is rewarded.

MEDICINE MAN GETS BUSY

Ocimbanda has been silent as befits a doctor and worker of magic, for who would confide in a chatterbox? It is true he has pointed out a few herbs, saying, "This will make a mother strong after her baby is born, and here is a plant whose leaves give off smoke that brings a fainting person back to life." He has collected many samples of leaves, roots, and berries, and these he stows carefully in a leather pouch at his waist.

A very active little dog, like a small greyhound, has been the life of the hunting party. The tips of his pointed ears are nicked "to make him hear well," so the hunter says, and now all alert, he dashes into the bush. *Ocimbanda*, the medicine man, snatches a

ANGOLAN LEOPARD TRAP

Sliding door imprisons unwary animal in the little log cabin.

wooden club from one of the boys and follows into the thicket, from which he soon emerges dragging a dead python, just a small one about five feet long, but thick in the body. The meat is quickly shared, but the medicine man seems concerned mainly with cutting out the backbone. From the vertebrae he will make necklaces to cure rheumatism. An afflicted patient who wears such a necklace is said to become supple as a serpent. Later, *Ocimbanda* is delighted with a small porcupine, and he loses no time in pulling out the quills to make the kind of headdress he prefers when performing magic.

The hunting party is now meandering along the banks of a sluggish river, which yields nothing to those who are fishing with a bark line baited with a grasshopper. But in his pouch the medicine-man has a narcotic powder made from tuberous roots. He scatters a handful on the surface of one of the pools in the partly dried river bed. Presently a few fish float to the surface completely stupefied by the narcotic. He quickly transfers them to a small-mesh string bag and we are on our way.

MAGIC OF THE NIGHT

To return to the village there is much rugged country and thick bush to cover, and with some anxiety *Ukongo* points to the sun not far above the horizon. "The stars will guide us," he says, pointing to the sky. "There you see the stars named hunter, dog, and antelope. They are over our village at this time of the year." So we start plodding along in that direction.

There is whispering between the hunter and the medicine man; then with a bright smile the former takes a handful of earth broken from a termite (white ant) hill. This clod he places carefully in the forked branch of a small tree saying, "O sun wait a little while for us." Everyone agrees that twilight, which is brief in the tropics, has lingered a little longer tonight, but not long enough. *Ocimbanda* cups his ear. "Let us hurry," he says, "I hear the cry of the night bird *esuvi* who can steal human spirits, and we do not wish to hear the screech of the night owl *onjimbi* whose voice may be the call of death."

So we hasten from the darkness to the light of village fires. Women run out to greet us and examine the food supply. They praise the boys in particular for the luxury of honey obtained by smoking out wild bees from a hollow tree. The python meat is soon simmering in the pot with abundance of corn. Someone is busy making the soup by squeezing caterpillars. The three mice caught in the cane trap are boiled, then laid on hot charcoal, a process eagerly watched by the three boys who caught them. The youths carry on an animated discussion; then the oldest of them examines the mice, selects one that appears to him as particularly appetizing, and suspending it delicately by the tail makes an offering to me as the guest of the group.

EXPLORER DUCKS MOUSE DELICACY

"Taboo" is a magical excuse. Food taboos are so frequently imposed by medicine men for physical and spiritual reasons that my excuse is accepted without question. If further explanation were needed, there were three little mice and three little boys, making a fair division quite simple.

The drums begin their rhythm, the feast is on, shuffling feet will continue far into the night.

For many years out of print, with rare copies sold second-hand at a premium price of $50, the famous book *Jade* by the late Dr. Berthold Laufer, former Curator of Anthropology at Chicago Natural History Museum, is now available in a new edition at $12.50 in the Museum Book Shop.

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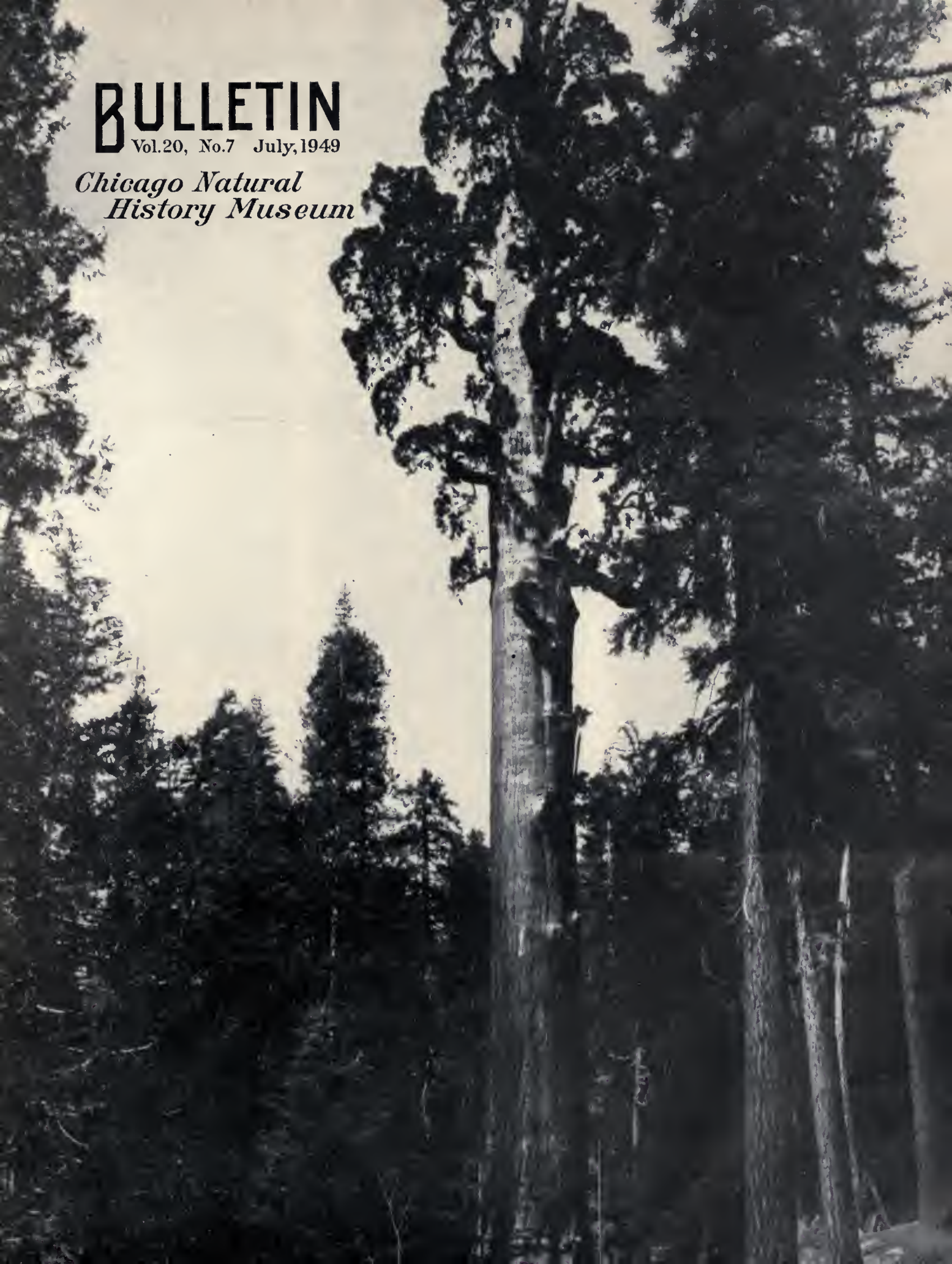

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They Err Like Human Beings . . .

MALADAPTATION IN BIRDS

BY AUSTIN L. RAND
CURATOR OF BIRDS

THROUGH selection, birds have become adapted to their environment. In most cases this is successful adaptation. Occasionally, however, we come across instances in which the adaptations do not work out. Such cases, where the actions of the bird are not of benefit to it or are even detrimental, come as surprises.

The introduction of the Tartarian honeysuckle (*Lonicera tatarica*) into the United States from Asia and its planting as an ornamental shrub provides each fall a display of red juicy fruit. This fruit contains saponin, a substance that has the effect of an anaesthetic and muscle poison and may paralyze the greater nerve centers (in sufficiently large doses saponin causes death by cardiac paralysis). A condition of intoxication has been recorded for robins feeding extensively on these honeysuckle berries: ". . . this drunkeness has been seen in every shade of severity, from mild unsteadiness to a degree of inco-ordination sufficient to cause the birds to fall to the ground. It seems to make some of the birds utterly fearless and perhaps a bit belligerent, for they become quite unafraid of passers-by and interested spectators. A few dead robins have been found about these honeysuckle bushes—presumably poisoned by the berry diet."

The California woodpecker ordinarily differs from many birds because it does not lead a hand-to-mouth existence but stores food. These woodpeckers feed extensively on acorns, and one way they store them is by drilling holes in the bark of a tree and into each hole fitting an acorn. The whole trunk of a tree thus may be pitted with stored acorns. When the acorn crop fails and the nuts are scarce the woodpecker goes through the same storage activities but, being unable to find sufficient acorns, it stores pebbles instead. These pebbles are of course quite useless to the woodpecker, and this is an interesting example of an instinct "gone wrong."

Sometimes these woodpeckers have another method of storing their acorns. This is by dropping them into cavities in tree trunks, but "when stored in such cavities there seems to be no way by which the birds can reach them." Here again we have a blind impulse to store but in such a way that the bird gains little or nothing by the act.

The raven is ordinarily and quite correctly considered one of the most intelligent of birds, but a raven in captivity that was fed on small fish attempted to store these fish by pushing them through a knothole in the back of its cage. The fish fell about 15 inches below the knothole where the raven could not possibly reach them, and after each time the raven peered through the knothole, though it could not see the fish. Here again we have the instinctive storing act carried out in such a way that it produced no benefit to the bird.

The late George Latimer Bates, noted ornithologist, studying the birds of West Africa found a most surprising thing in connection with one of the honey-guides. As a group these birds are noted for the habit of attracting the attention of human beings and leading them to bee trees, presumably so that they will break down the bee tree for the honey, and the birds can feed on the scraps left over. Bates found that the West African species is parasitic on other birds in its nesting habits and its young have been found in the nesting hole of a little barbet. This barbet was a much smaller bird than the honey-guide and the entrance to the nest hole was so small that Bates doubts that the honey-guide would have been able to get in to lay its egg. He suggests that the egg may have been laid elsewhere and deposited in the nest by the parent's bill. It is difficult to understand how the young honey-guide would be able to get out, for when fully fledged it would have been far too large to squeeze through the entrance that admitted the tiny body of its foster parents, the barbets. This, too, looks like a case of maladaptation.

Cartoon by Margaret G. Bradbury

FEATHERED DELINQUENT

Although Miss Bradbury has here availed herself of artist's license, Dr. Rand cites in the accompanying article instances in which birds have been known actually to get "drunk" on the juice of certain berries.

The life and customs of the peoples of Fiji, Samoa, Tonga, Cook Islands, Hawaii, New Zealand, and Society and Marquesas islands in Polynesia and of the peoples of the Gilbert, Marshall, and Caroline groups and outlying islands in Micronesia are illustrated by exhibits in Hall F.

THIS MONTH'S COVER

Many Chicagoans vacationing in the West this summer will see scenes like that on our cover. This magnificent specimen of giant sequoia was photographed in Sequoia National Park, California, by Prof. E. J. Kraus, of the University of Chicago. These trees, 1,200 to 2,000 years in age, are the oldest and most massive of all living things. They attain heights from 80 to 225 feet before the first limb and often grow to 330 feet. Frequently they reach 12 to 17 feet in diameter.

An exhibit in Stanley Field Hall, to be ready in July, will show fossil members of Metasequoia, 50-million-year-old relatives of our famous big trees, and herbarium specimens and a wood sample of the only living member of Metasequoia recently discovered in remote parts of China—the nearly extinct dawn redwood. An article on this "living fossil," by Dr. Theodor Just, Chief Curator of Botany, will be found on page 3.

'SHUI-HSA,' THE DAWN REDWOOD, STILL LIVES IN CHINA

By THEODOR JUST
CHIEF CURATOR, DEPARTMENT OF BOTANY

CHINA, the mother of gardens, has given the world another real surprise. Widely acclaimed in the daily press and elsewhere, the discovery of an unknown conifer in 1945 in eastern Szechwan and later in northwestern Hupeh, provinces in the heart of China, precipitated immediate public interest as well as intensive study and exploration by Chinese and American botanists.

'DISCOVERY TREE' IN CHINA

Sketch of dawn redwood at Mo-tao-chi in southeastern area of the province of Szechwan. The building beneath the tree is a temple built by natives. Illustration by courtesy of Dr. H. H. Hu, of Fan Memorial Institute of Biology in Peiping.

Curiously enough, the "discovery" tree is still the largest specimen known. Ninety-eight feet high and 68 inches in diameter above the buttress, it stands by itself in the temple grounds at Mo-tao-chi, about 140 miles northeast of Chungking at the geographical latitude of New Orleans.

This tree and two others were found by Tsang Wang, who submitted his find for study to Dr. W. C. Cheng, of the National Central University, Nanking, and Dr. H. H. Hu, of the Fan Memorial Institute of Biology, Peiping. Further exploration was made possible by American grants from the Arnold Arboretum and, as a result of this co-operation, many seedlings are now growing in American botanical gardens.

FOSSIL 'COMES TO LIFE'

Although many plants new to science are being collected, studied, and described every year, the significant event in this case was the fact that this new conifer could be identified with a fossil redwood described as *Metasequoia* during World War II by a Japanese botanist, Shigeru Miki, from Pliocene clay deposits in Japan about seven or eight million years old.

Thus a fossil had virtually come to life. However, other fossil redwoods have been shown to be considerably older than the Japanese deposits. For instance, a fossil species had been described from the Fushun coal mines in Manchuria by a Chinese paleobotanist, and elsewhere in the world many fossils had been found, so far collectively referred to the genus *Sequoia*, containing two living species, the American redwood and big tree of California and Oregon.

Professor Ralph W. Chaney, of the University of California, the only American botanist who has so far had the opportunity to see the remarkable locality where the dawn redwood is still growing, re-studied many of these fossil collections and found that those from the Cretaceous and early parts of the Tertiary should now be referred to *Metasequoia* and the rest retained in *Sequoia*. On this basis *Metasequoia* is to be regarded as the forerunner of the modern sequoias rather than as their successor, as its name might suggest.

A NEW FAMILY

In 1948, the living dawn redwood of China was given the specific name *Metasequoia glyptostroboides* by Cheng and Hu and placed in a new family. *Metasequoia* apparently resembles another Chinese conifer, the water pine of southern China, *Glyptostrobus pensilis*, in its habit and leaves, but its cones resemble those of *Sequoia*. Fossil material of *Metasequoia* is barely distinguishable from living plants. In some respects the new genus is related to the Taxodiaceae, including among others the sequoias and bald cypress, and in other respects the Cupressaceae, containing arbor vitae, the junipers, and others. The dawn redwood is locally called "shui-hsa," while elsewhere in China this name is applied to the common water pine.

Metasequoia differs from its related genera largely by the prominent decussate (crosswise) arrangement of all of its vegetative and floral organs rather than the spiral arrangement of leaves and other structures, as found in the American redwood and bald cypress. Even the scales of the female cones of *Metasequoia* show this characteristic arrangement. Female cones are borne terminally on long, probably lateral leafy shoots that often appear leafless after the widely spaced leaves have fallen off. Male cones are decussate in long spikes and are often twisted into opposite pairs. The wood structure is said to be similar to that of *Sequoia*. The bark is of reddish color but thinner than that of the American redwood. In winter condition, the nude branches clearly point upward rather than downward, as they do in the living *Sequoia*.

To date, about 1,000 trees of the dawn redwood have been located in its relatively small area, a basin and adjacent valleys protected by mountain ranges and characterized by an equitable moist climate. Here they grow isolated at elevations from 2,400 feet to about 4,500 feet either at valley bottoms near streams, in rice-paddies or in sheltered ravines, and on slopes in association with other conifers and hardwoods, rather than in solid stands. However, they are more numerous in the valleys south of this basin, especially the "Shui-hsa-pa" of Hupeh, so named for the many redwoods present there. The most common associates are: three species of chestnuts, a small-leaved oak, sweet gum, cherry, and evergreen shrub related to spice bush, and, on the slopes, birch, beech, katsura (an Asiatic species), four species of conifers and small fan palms, also maples, alders, elms, hornbeams, hop hornbeams, and others.

This exceedingly interesting community represents today the only direct approach to the study of a now largely extinct flora, known as the Arcto-Tertiary flora. This flora was once widespread in the Northern Hemisphere and ranged far into the Arctic region. Later, under the influence of changing climates, it migrated south and passed through certain changes, leaving only remnants in definitely restricted regions. These are the mixed bald cypress–hardwood forests found along the Gulf Coast and extending north as far as the Wabash River area of lower Illinois and Indiana and some mixed forests containing conifers and hard-

(*Continued on page 4, column 2*)

'BIG TREE' DWARFS MAN

This specimen in General Grant National Park, California, shows the massive trunk of Sequnia. Photograph by Prof. E. J. Kraus, Department of Botany, University of Chicago.

ECONOMIC GEOLOGY STORY TOLD IN NEW EXHIBIT

By ROBERT KRISS WYANT
CURATOR OF ECONOMIC GEOLOGY

The reinstallation of economic geology exhibits in Hall 36 is now nearly complete. Of prime interest to students and Museum visitors is the systematic presentation of metallic mineral deposits.

Two introductory cases are located near the center of the hall. One contains rock samples, ore specimens, a map showing areal distribution of igneous rocks in the United States, and a map showing the distribution of ore deposits in the same area. These two maps clearly indicate the close areal relationship between igneous rocks and ore deposits. The second case contains a geologic cross-section illustrating the various types of igneous structures and the relationship of the four main classes of ore bodies to these structures.

The bulk of metallic mineral deposits has been systematically divided into four general groups:

I. Minor and Rare Metals. The minerals exhibited contain metals that occur only in small quantities in nature. Nevertheless, some of these are very important in modern industry. The list of rare and minor metals includes mercury, arsenic, bismuth, titanium, zirconium, columbium, tantalum, antimony, magnesium, beryllium, radium, and uranium.

II. Iron and Ferroalloy Metals. These exhibits consist of the more important ore minerals of iron and those metals that are alloyed with iron. The alloying metals on display are manganese, nickel, chromium, molybdenum, tungsten, vanadium, cobalt, and titanium.

III. Nonferrous Metals. The nonferrous metals rank second only to iron in importance in modern industry. The metals exhibited are used in large quantities and include the ores of copper, lead, zinc, tin, and aluminum.

IV. Precious Metals. Gold, silver, and platinum are the members of the precious metals group on exhibition in this hall. Specimens of platinum ores are limited because of the scarcity of that metal.

GOLD EXHIBIT

The gold exhibit is of special interest to many Museum visitors. As is well known, the quest for gold has led to the conquest, colonization, and exploration of much of the world.

Geologically, gold occurs chiefly as a primary mineral in quartz veins or lodes. Placer deposits, which are the result of the weathering of gold-bearing rocks, supply about one-quarter of the world's supply of gold. Small amounts of metallic gold are present in metallic sulphides along with other nonmetallic minerals. These associated minerals are clearly indicated in the gold exhibit. Because gold is a persistent mineral, it is found in deep-seated, intermediate, and shallow veins. These veins and lodes have been formed by hot solutions in igneous and related rocks.

The largest single use of gold is as a base for monetary systems, such gold being kept in the form of bullion. The second largest use of gold is for ornamentation, the latter use being based upon the ductility, malleability, and insolubility of metallic gold.

Current gold production is largely derived from the following countries: South Africa, United States and territories, Canada, Russia, Australia, South America, West Africa, and Mexico.

In the near future several table cases are to be installed in Hall 36. The cases will contain examples of the common uses of the metals derived from the ores now exhibited in the vertical cases.

DAWN REDWOOD—

(Continued from page 3)

woods at middle altitudes on the island of Hondo in Japan. Apparently the equitable summer-wet climate of more than 40 inches of annual rainfall and rarely freezing temperatures in this small area of Central China is the ideal climate in which the dawn redwood forest could survive.

The deciduous habit of *Metasequoia* may have developed as a result of the darkness of the Arctic night rather than in response to other factors, for in the early Tertiary (Eocene) *Metasequoia* ranged as far north as 82° N on Grinnell Island. Its deciduous habit is also consistent with that of its associated hardwoods. Later migrations of this forest to the south indicate the northern origin of this flora and are substantiated by the numerous fossil records left by it. Some ten species of fossil *Sequoias* have by now been transferred to *Metasequoia*. Actually, *Sequoia* like *Metasequoia* moved into the coast area from the north as climatic conditions changed and the subtropical plants growing there originally were forced to migrate south. The redwoods found conditions of climate and topography on the West Coast as suitable as the living *Metasequoia* did in the interior of China.

BOTANICAL SHANGRI-LA

By the end of the Tertiary even *Metasequoia* disappeared from the fossil record, though its living species is hardly different from its forerunner. Fossil *Sequoia* appears to have originated about the middle Tertiary, as all reports of its greater age were apparently based on material now referable to *Metasequoia*. Thus the history of the longest-lived plants, estimated to live 2,500 years and more, is also long in terms of geological history. However, some of our commonest plants have at least an equally long, and often longer, history or genealogy. But their discovery was considerably less spectacular and, as in the case of the pines, the plants were known even to the old Romans. None of these cases could give us the dramatic details recorded in connection with the discovery of the living dawn redwood. Our imagination quickly returns to this botanical Shangri-La and its glorious past.

An exhibit of dawn-redwood material from the type locality will be placed in Stanley Field Hall about July 15. The herbarium specimens included were received from the Arnold Arboretum, and the wood sample is exhibited by courtesy of Mr. A. F. Wilson, Flossmoor, Illinois. The fossil specimens shown are a gift from the United States National Museum. Original figures, prepared by Chinese botanists and printed in several botanical journals, will be included in the exhibit as examples of modern plant illustrations.

SIX MOVIES FOR CHILDREN IN JULY AND AUGUST

The Raymond Foundation will present its annual Summer Series of motion picture programs for children on Thursday mornings during July and August, beginning July 7. Because of demand for seats in past seasons, this year there will be two performances of each program instead of one performance, the first beginning at 10:30 A.M. and the second at 11:30.

The entertainments will be given in the James Simpson Theatre of the Museum. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the films:

July 7—THE LAST WILDERNESS
A year's pack trip in the Rocky Mountains with a champion archer.

July 14—SUMMER ON THE FARM
Also a cartoon.

July 21—THE KING WHO CAME TO BREAKFAST
And other puppet tales.
Also a cartoon.

July 28—THE MASKS THAT CAME TO LIFE
Indian ceremonies and masks.

August 4—WIND FROM THE WEST
A story, both fact and fantasy, from the land of the Lapps.
Also a cartoon.

August 11—THE ENCHANTED FOREST
The adventures of a little boy in a friendly forest.

PERIPATUS—'LIVING FOSSIL' AND 'MISSING LINK'

By RUPERT L. WENZEL
ASSISTANT CURATOR OF INSECTS

Few zoologists in the United States have seen a live "peripatus"—a peculiar worm-like animal that has been regarded, with some reason, as being both a "living fossil" and "missing link." Consequently, it was with more than usual interest that staff members recently greeted the arrival of four live *Peripatoides novae-zealandiae* (*see Figures 1, 2*) that were sent to the Museum by Mr. B. M. Bary of Victoria University College, Wellington, New Zealand. While attending the Seventh Pacific Science Congress in New Zealand earlier this year, Chief Curator Karl P. Schmidt met Mr. Bary and expressed such interest in acquiring some live specimens of this animal that the unusual shipment resulted.

FIGURE 1

One of the four live Peripatoides novae-zealandiae received from New Zealand. View from upper side.

BILLION-YEAR ANCESTRY?

These remarkable creatures belong to the Phylum Onychophora, an extremely ancient group that has existed for at least one-half billion years. A fossil form, *Ashyeaia pedunculata* (*see Figure 2*), has been described from Middle Cambrian deposits of that age. The illustration shown is of a hypothetical reconstruction, but the actual fossil specimens show most of the details of the external structure rather clearly.

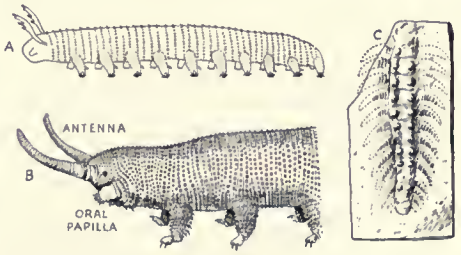
If the fossil described as *Xenusion auerswaldi* (*see Figure 2*) actually represents an onychophoran or onychophoran-like animal, as it seems to, then the beginnings of the group might be extended back another one-half billion years, for *Xenusion* is from Proterozoic Algonkian rocks that are approximately a billion years old. Judging from the deposits in which these fossil forms were found, the early Onychophora were marine.

The living species are terrestrial. They are few in number—about eighty species—and occur in the West Indies, Central and South America, South Africa, and the Indo-Australian region. Although they are terrestrial and have special breathing tubes known as "tracheae," they are restricted to very moist environments; their thin skin makes them subject to very rapid desiccation. They generally avoid light and live in rotten logs, under stones, under loose bark, etc., where they feed on small insects and other micro-organisms. Most of the species are small—about 2 to 3 inches long—but at least one attains a length of 5 inches.

One of the interesting protective adaptations of these animals is the ability to squirt a sticky, slime-like secretion that effectively tangles their enemies. The slime is secreted by long internal slime glands that extend almost the entire length of the body and is ejected from a pair of "oral papillae" (*see Figure 2*), of which one is on each side of the head. Certain species can squirt the slime as far as twelve inches. Some Onychophora lay eggs. Others give birth to living young; in such species, special placenta-like structures may develop to facilitate the diffusion of nutrient materials through the uterine wall of the mother to the developing embryo, in much the same fashion as in mammals.

WORM-ARTHROPOD LINK

It is not only because of their great antiquity that the Onychophora excite the curiosity of the zoologist. An even greater fascination lies in the fact that these animals possess anatomical features both of the segmented worms (Annelida), of which the common earthworm is a familiar example, and the Arthropoda, the great phylum that contains the crabs, lobsters, shrimps, spiders, scorpions, millipedes, centipedes, and insects. There can be little doubt that the arthropods evolved from worms or worm-like ancestors, and many zoologists consider that the Onychophora are an intermediate or linking group between the worms and the arthropods. It is more probable, though, that the Onychophora represent an offshoot from the main line of evolution between the two. Interestingly enough, the first peripatus described was considered a mollusk! It was not until after careful anatomical studies had been made that its position in the animal kingdom was appreciated.



Drawings after Snodgrass

FIGURE 2

(A) Ashyeaia pedunculata, a fossil form from Middle Cambrian—hypothetical restoration; (B) Peripatoides novae-zealandiae—side view of head end of body; (C) Fossil of Xenusion auerswaldi, from Proterozoic Algonkian.

Before the war, Dr. Ralph Buchsbaum, Research Associate in Zoology at the University of Chicago, and Mrs. Buchsbaum, collected a species of *Macroperipatus* in the Panama Canal Zone and were fortunate enough to bring it back alive to Chicago. They were able to make excellent photographic studies, both still and motion-picture, over a period of several months. The Museum specimens were probably the only other live Onychophora ever to reach Chicago. Unfortunately, they lived only long enough for interested staff members to observe them briefly and take a few still and motion pictures.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

TEMPLES IN YUCATAN: A Camera Chronicle of Chichén Itzá. By Laura Gilpin. Hastings House, New York, 1948. 124 pages, 103 photographs, 4 maps. $5.

Chichén Itzá is probably the most famous of the ruined Maya cities that dot the peninsula of Yucatan. Laura Gilpin's handsome book on this sacred center of the early Mayas will stir any reader's interest in Chichén's magnificent structures, while the volume also serves as a stimulating introduction to the civilization of the ancient and modern Mayas.

Temples in Yucatan is primarily a collection of photographs. These are of exceptional esthetic quality and also are carefully chosen to illustrate the unique style of Maya architecture and its local development at Chichén. In addition, the inclusion of the life of the modern Mayas as photographic subject matter serves to tie the ancient city to the modern descendants of the city's original builders.

This camera chronicle is supplemented by a brief and clearly written text and captions. Enough information is given to set the photographs in meaningful context. An example is the section on the importance for Maya religion and architecture of the Maya calendar. A number of carefully drawn maps show the spatial arrangement of Chichén Itzá's major temples and buildings, without including meaningless and confusing detail. The format is technically excellent and artistically pleasing.

The prominence of Chichén Itzá led to its being chosen the subject of a recently completed model diorama in the Museum's new hall of American archaeology. *Temples in Yucatan* is recommended reading to accompany this diorama and the Museum's other exhibits on the Maya Indians, and to deepen the reader's understanding of Maya civilization.

ALEXANDER SPOEHR
Curator, Oceanic Ethnology

MISSIONARY-ORNITHOLOGIST'S AFRICA COLLECTION

Army officers and administrators, as well as explorers and scientists, have played a large part in the study of African birds. This is also true of the other branches of zoology covered by the Museum. But as one reads the history of bird study, the names of missionaries also appear with frequency. Some of these naturalist-missionaries gave life-history details, such as the accounts of the habits of the honeyguides and the seasonal moults of bishopbirds by Father Jerome Merolle da Sorrento. Notes on birds were made by that great African traveler, David Livingstone, and collections of specimens have been made by such people as Rev. Father R. Callewaert, Rev. Father Goossens, Rev. H. M. Whiteside, Father Moons, and Rev. J. A. Reis.

BUSY DAY IN THE BIRD DIVISION

Unpacking bird skins. The specimens come from the field wrapped in paper or cotton, or between layers of cotton, lying side by side, row on row, in packing cases. They are unpacked, sorted, and arranged in trays; then they are filed in receiving cases, seen in the background, until identified, catalogued, and incorporated in the collection. The workers are (left to right): Emmet R. Blake, Associate Curator of Birds; Mary Jane Allen, assistant; Melvin A. Traylor, Jr., Research Associate, Birds, and Dr. Austin L. Rand, Curator of Birds.

Another name that will always have an important place in the study of Cameroon birds is that of Rev. A. I. Good. Good has just returned to this country after some 30 years spent in West Africa at Cameroon as one of the principal members of the Presbyterian Mission there. In Africa he found time, between multitudes of other tasks, to conduct extensive field studies of birds and to make large bird collections. His bird work is so well known that the French government has commissioned him to prepare a volume on the birds of Cameroon.

Recently, when Good returned from Africa on his retirement, he brought with him a collection of about 800 birds, representing more than 260 species. This the Museum has been fortunate enough to acquire. We have some West African birds, but this new collection fills some of the many gaps and adds many species to our collections.

Cameroon is a strategic area in African bird study. It is on the east side of the Gulf of Guinea in the northwest corner of the great block of tropical rain forest that centers about the Congo River basin and is called the Lower Guinea forest. The one other, much smaller, block of rain forest is on the north coast of the Gulf of Guinea. In studying the avifauna of either, Cameroon birds are important.

The collection is well prepared and well labeled, and the wonderful assortment of species in it makes it a delight to handle. One of the noteworthy additions to our collection in this acquisition represents an endemic West African subfamily, the Picathartinae. There are only two species of these strange-looking birds, both about as large as a small crow, gray above and white below, with black, blue, and yellow heads and strong feet and bills. They used to be called bald-headed crows; but recently they've been shown to be related to starlings, and Bannerman has rechristened them, by way of a common name, bald-headed rock-fowl. They live in rocky forest country, hopping about on the ground and low shrubs, but they are so rare and local that few white men have seen them alive. So intriguing are they that in 1937 Dr. G. R. Walker made a special trip from England to Sierra Leone to study them and was successful in being able to watch a number of them.

When the collection was laid out in the Museum trays, the tray of bulbuls was particularly interesting. Bulbuls get their name from the Arabic through the Persian "in the poetry of which language it plays a great part," and there it is apparently synonymous with songster, as is nightingale in ours. While bulbuls may be noteworthy for their voice, there is little of distinction in their appearance. Small or medium-sized birds, they are mostly clothed in somber olives and grays and yellows.

To look at the tray of bulbul specimens from the Good collection the uninitiated might think there were possibly three or four rather variable species. But there are actually seventeen species in the tray. Several are almost identical in color; but small differences in proportions, bill size and shape, and foot and wing structure separate them sharply, so that biologically they are quite distinct species. Apparently the birds can recognize the differences between the species more easily than man can recognize them.

A NATURAL ISOLATIONIST

Guinea fowl are known to many people as the speckled fowl sometimes kept by farmers because their noisy cries are thought to keep away hawks. Other people know them as a game bird running in bands on the grassy African savannas. But this new collection contains a black guinea fowl, a bird restricted to the forests of the Cameroon area and so rare and shy that little is known about it except that unlike other guinea fowl it is usually solitary or in twos or threes.

A most remarkable bird in the collection is the finfoot. In appearance it is rather grebe-like, but its head is more like that of a rail, its tail long and stiff like that of an anhinga, and its feet lobed like those of a coot. Though really related to the rails, it swims well, sometimes with only its head out of the water; it flies readily; on land it runs like a rail and climbs into bushes. It belongs to an old, circum-tropical group, with relatives in the American tropics and in southern Asia.

Tailor birds are usually thought of as the Asiatic warblers that sew together leaves for nests. Less generally known is the fact that many African species do the same. The collection contains a grayish African tailor bird. It sews the edges of leaves together with cobwebs and puts a few strands of fiber in the bottom of the chamber thus formed for the nest. So light is the nest that it hardly depresses the leaf in which it is placed.

IMPRISON THEIR FEMALES

There are few birds in the collection that would look familiar to an American bird student. There are hornbills, notable for their huge bills and their habit of sealing the female into the nesting hole during the incubation and brooding period; emerald cuckoos, which some people consider the most beautiful of African birds; plantain-eaters; mouse-birds; rollers; barbets; broadbills; various relatives of cuckoos; and woodpeckers not unlike those of North America.

Among the song birds the paradise flycatchers are striking, with the long streamers in their tails; the many sunbirds with their iridescent plumage, their long bills, and their habits of feeding at flowers recall the quite different hummingbirds; the array of weaver birds, some beautifully colored in yellows,

reds, blues, and blacks, is bewildering. It is this group of birds, with thick bills, the seed eaters of Africa, that replaces the sparrows of America. There are only two species of sparrows in the collection as compared with forty-seven found around Chicago.

This representative collection, coming as it does from a comparatively well-known area in West Africa, will serve as an essential basis of comparison for the study of other African material in our collection.

AUSTIN L. RAND
Curator of Birds

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

Among the acquisitions of more than ordinary interest received by the Field Columbian Museum during 1899 were 1,600 specimens of pottery, stones, ceremonial objects, clothing, etc., illustrating the past and present of the Hopi Indians. This

HOPI BRIDE

Part of the Stanley McCormick Hopi Indian Collection. The model was cast from life and sculptured by F. B. Melville. It is now exhibited in Hall 7.

generous gift of Mr. Stanley McCormick added to the growing collection of Hopi Indian material collected by Mr. George A. Dorsey, Curator of Anthropology, and purchases from Rev. H. R. Voth. Many of these ceremonial objects and fetishes are now unobtainable. A large portion of the McCormick collection was immediately installed.

* * *

The American Indian material acquired by the active field program of the Museum in its early years is in general quite irreplaceable. This, of course, is the case with the material culture of all native peoples who have come into contact with civilization in recent decades.

SUMMER LECTURE TOURS GIVEN TWICE A DAY

During July and August, conducted tours of the exhibits, under the guidance of staff lecturers, will be given on a special schedule, as follows:

Mondays: 11 A.M., Story of Plants—Basis of All Life (general survey of the plant exhibits); 2 P.M., General Tour (exhibition halls, all departments).

Tuesdays: 11 A.M., Places and Peoples (general survey of the anthropology exhibits); 2 P.M., General Tour.

Wednesdays: 11 A.M., Records from the Rocks (general survey of the geology exhibits); 2 P.M., General Tour.

Thursdays: 11 A.M. and 2 P.M., General Tours.

Fridays: 11 A.M., The World of Animals (general survey of the animal exhibits); 2 P.M., General Tour.

There are no tours given on Saturdays and Sundays, or on Monday, July 4.

Plastic Techniques Illustrated

A special exhibit on "Plastics and Other Media in Museum Exhibits," prepared by Mr. Emil Sella, Curator of Exhibits in the Department of Botany, is now on view in Stanley Field Hall. The material was used in May in a demonstration for the annual meeting of the American Association of Museums.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum during the last month:

Fieldiana: Geology, Vol. 10, No. 7. *A New Silurian Trilobite, Dalmanites Oklahomae.* By Eugene S. Richardson, Jr. June 6, 1949. 3 pages, 2 text figures.

Fieldiana: Zoology, Vol. 31, No. 29. *Notes on Growth and Reproduction of the Slimy Salamander, Plethodon Glutinosus.* By Clifford H. Pope and Sarah H. Pope. June 6, 1941. 12 pages, 6 text figures.

BOTANY RESEARCH WIDENED BY SOUTHWEST EXPEDITION

By HUGH C. CUTLER
CURATOR OF ECONOMIC BOTANY

No question is more familiar to the staff of the Department of Botany than "What is the name of this plant?" The botanists of the Museum spend the greater part of their time in studying and naming the thousands of plant collections brought back by expeditions of the Museum and of other institutions. As a result, our study collections and publications on the floras of the Latin-American countries are outstanding.

By comparison, the research of the Museum's Southwestern Botanical Expedition of 1949, sponsored by Mr. Joseph Desloge, of St. Louis, was planned to secure information and materials on how certain species of plants differ from each other and how these different plants might have originated. These studies were conducted principally on the joint-firs or Mormon tea plants of the Ephedra family. Chinese species of Ephedra were for many years the only source of ephedrine, a drug used in treating nasal and sinus infections until a few years ago when synthetic ephedrine and later benzedrine were manufactured for the same purpose.

The Ephedras are of especial interest to botanists because they occupy a position midway between the Gymnosperms or cone-bearing plants and the Angiosperms or plants with enclosed seeds. The wood of Ephedra, too, is intermediate between the softwoods and the hardwoods. One of them, *Ephedra trifurca*, is shown in Case 821 of Martin A. and Carrie Ryerson Hall (Plant Life—Hall 29) in connection with models of related plants.

CHROMOSOME STUDY

In addition to the botanical interest in Ephedra as a possible connecting link in the plant kingdom, there was a practical reason for choosing to study this group:

Within the cell, which is the basic unit of a plant, are the chromosomes, linear structures that can be deeply colored by some common biological stains like carmine. The number of chromosomes in a cell is usually constant throughout a plant. By studying the changes and actions of the chromosomes at certain stages of development we can tell much about the past history and evolution of the plant. As many chromosomes are small and difficult to see even under powerful magnification, the most intensive research has been done on plants and animals that have a low number of large and easily observable chromosomes. It is partly for this reason that we know more about the mechanics of inheritance in the fruit fly (with four pairs of chromosomes) and in corn (with ten pairs of chromosomes) than we do in man (with twenty-four pairs of chromosomes).

(Continued on page 8, column 1)

STAFF NOTES

Dr. Robert H. Denison, Curator of Fossil Fishes, has gone to the Southwest for a three-month reconnaissance to advance his studies and collections of fishes of the Devonian period. He is working on Rocky Mountain sites in Arizona, Wyoming, Colorado, and Utah.... **Mr. Clifford H. Pope,** Curator of Amphibians and Reptiles, will spend the summer in continuance of his work on the salamanders of North Carolina and Virginia, working from headquarters made available by the Mountain Lake Biological Station in Virginia.... **Colonel Clifford C. Gregg,** Director of the Museum, was the commencement speaker in June for Morgan Park Military Academy.... **Dr. L. H. Tiffany,** professor of botany at Northwestern University and Research Associate in Cryptogamic Botany at this Museum, was awarded the honorary degree of Doctor of Pedagogy by Eastern Illinois State College at Charleston.... Chief Curator of Zoology **Karl P. Schmidt** made a transcription at the WMAQ studios on "The Nature of a Natural History Museum" for the radio station in Norfolk, Va.... **Mr. Henry S. Dybas,** Assistant Curator of Insects, spoke before the ecology group at the University of Chicago on the insect fauna of the Pacific islands. Mr. Schmidt spoke on his recent experiences in New Zealand.... **Dr. Theodor Just,** Chief Curator of Botany, recently conducted a botanical seminar for the faculty and students at the University of Michigan, Ann Arbor. His subject was "Some Aspects of Plant Morphology and Evolution."

BOTANICAL EXPEDITION—

(Continued from page 7)

There are only seven pairs of medium-sized chromosomes in most species of Ephedra and, since these can be readily stained with the simplest of laboratory methods, Ephedra was chosen for study.

Most of the field work was done in northeastern Arizona and in adjacent Utah. This is part of the Navaho Indian Reservation where the only inhabitants are seminomadic Indians and a few white traders, missionaries, and teachers.

ROADSIDE LAB WORK

As soon as an area of Ephedra in the correct stage for study was found, the microscope and stains were set up on the tail gate of the station wagon. A series of plants was collected and several flowers from each plant were examined. This was done by pressing out the developing cells onto a small drop of stain on a glass slide. If the stages with active cells and with chromosomes in the proper condition for study were found, a large number of flowers from the same plant were cut open and preserved in a mixture of acid and alcohol. These flowers will be examined more critically at the Museum with a better microscope than the one carried in the field. Occasionally a study slide showed the chromosomes so clearly or in so rare a stage that it was preserved. This was done by washing the slide carefully with a series of solutions until all moisture was removed and the chromosomes were in a nearly pure solution of balsam solvent. Then Canada balsam was added and the slide covered with a thin cover glass. Because the chromosomes are so small, it is essential that no dust and dirt be present on the slide.

The most interesting part of the study was made on a series of hybrids between common species of Ephedra. Normally the species are distinct, but occasionally they will cross and form a series of intermediates. In several places it was possible to gather material of each parent and of the intermediates and to study the behavior of the chromosomes as well as the gross structure of the plants.

While we were making slides of some of these hybrids, two Navaho boys rode into the expedition camp and, after sitting quietly and watching for about fifteen minutes, one of them asked if he could "listen to the stones." They had seen prospectors traveling about the reservation testing deposits of radioactive ores and assumed the microscope was a Geiger counter.

About 40,000 individual plant colonies were examined and more than 300 of these were studied under the microscope. All of the Ephedra species of northern Arizona were investigated, and from the material examined in the field and that being studied at the Museum we will be able to determine the number of chromosomes, their structure, and the interrelationships of the various species of Ephedra.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Mrs. W. P. Morrill, Chicago—50 stone axes and broken arrowheads; Col. J. K. Tully, Evanston, Ill.—a whaling harpoon and 2 bone arrowheads, Alaska; Allyn D. Warren, Chicago—a wood carving of Vishnu mounted on Garuda, and a carved wood plaque, Dutch East Indies.

Department of Botany:

From: Donald Richards, Chicago—50 specimens of marine algae, New Zealand; Dr. George D. Fuller, Chicago—26 herbarium specimens, Illinois and California; University of California, Berkeley, Calif.—126 herbarium specimens, Colombia; Facultad Agronomia de Colombia, Cali, Colombia—170 herbarium specimens, Colombia; Dr. Richard Evans Schultes, Cambridge, Mass.—86 herbarium specimens, Colombia; Louisiana State University, Baton Rouge, La.—about 5,000 specimens, mostly sherds, but including artifacts of stone, bone, shell, and fired clay, Louisiana.

Department of Geology:

From: R. T. Thompson, Phoenix, Ariz.—an aragonite specimen, Arizona; Charles M. Barber, Flint, Mich.—2 turtles, Alabama.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—2 mammals; Lincoln Park Zoo, Chicago—a mammal and a diamondback rattlesnake, Asia and Florida; Miss Carolyn M. Cory, Homewood, Ill.—an ovenbird, Illinois; Dr. Hans Schlesch, Copenhagen, Denmark—11 specimens of freshwater shells, northern Europe; Dr. Thomas D. Allen, Chicago—2 snake skins, South America; Ross Tarrant, Wilmette, Ill.—26 miscellaneous fishes, Florida and West Indies; Harvey Hall, Homewood, Ill.—a Connecticut warbler, Illinois; Clyde P. Stroud, Chicago—a frog, New Mexico; Walter J. Eyerdam, Seattle—14 South American land shells; Robert T. Thompson, Phoenix, Ariz.—2 desert snail shells, Arizona; Dr. José O. Nolasco, Palawan, Philippine Islands—2 lots of internal parasites of the dugong, Palawan; Harry Hoogstraal, Chicago—34 beetles and a vial of batflies, New World; Dr. Wolfgang Weyrauch, Lima, Peru—31 lots of South American land and freshwater shells; Joseph H. Shirk, Peru, Ind.—7 mammal skulls, New Mexico, Arizona, and Canada; Dr. Julian A. Steyermark, Barrington, Ill.—69 specimens of freshwater shells in 3 lots, Missouri; Mrs. Hazel B. Gay, Chicago—17 insects, Mexico and Guatemala.

Library:

From: Carnegie Institution, Washington, D.C.; J. Lensly Gressitt, Canton, China; Archie F. Wilson, Flossmoor, Ill.

NEW MEMBERS

(May 16 to June 15)

Corresponding Members

Brother Léon
(Joseph S. Sauget y Barbier)

Contributors

John W. Moyer, Mrs. L. Byron Nash

Associate Members

George A. Bates, Elmer M. Petersen, G. H. Turner.

Annual Members

Norman C. Allingham, Philip T. Atwood, Henry B. Auerbach, Mrs. Mildred M. Bianco, Donald Boothby, Dr. Fremont A. Chandler, Miss Lynn Cooperman, Alfred Cowles, Mrs. May Crofoot, Louis G. Davidson, Eric C. Foote, Errett O. Graham, Arthur Halperin, Dr. Robert N. Hedges, Dr. Paul H. Holinger, Robert E. Keeley, Philip M. Klutznick, D. P. Loomis, L. B. McLaughlin, William J. McLaughlin, Sidney H. Morris, Hans Muench, Mrs. Ralph W. Owen, Lawrence A. Petersen, M. H. Petersen, Niels Petersen, Arthur B. Poole, Jr., Robert W. Poore, Dr. Paul D. San Filippo, W. Norman Schultz, Mrs. Claude W. Youker, M. M. Soule, Enoch Steen, Miss Genevieve A. Zaczek.

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BULLETIN

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Chicago Natural History Museum

AN ILLINOIS SCENE—
in the Coal Age (250 million years ago)

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

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Members are requested to inform the Museum promptly of changes of address.

'BIG GAME' HUNTING AND NATURAL HISTORY

Natural history museums everywhere have always had the support of hunters and fishermen, and many museums have had their origin in the interest of hunters of large or small game. Chicago Natural History Museum is no exception in this respect; it owes many fine habitat groups to special expeditions made for the Museum by big-game hunters, and many especially fine examples of large mammals have been acquired through individual gifts or private hunting trips. Indeed, there is an important relation between big-game hunting, the development of modern methods in taxidermy, and the rise of the great natural history museums. This is an interesting chapter in the history of museums that remains to be written. However, the gifts of heads of game animals, taken as trophies, would have been so numerous during the growth of the then Field Museum that it was realized at an early date that, as general Museum policy, even finely mounted game heads must be refused.

The existence of the Museum's study collections and of what is in effect an "Institute for Systematic Zoology" for their study is still not widely understood, in spite of the long series of publications in which we take as justifiable pride as in the exhibition halls. The recent gift to the Museum of a series of skulls of larger American carnivores, by Mr. S. H. Shirk, of Peru, Indiana, points to the possibility of additions to the study collections from members and friends of the Museum.

The Museum staff is always willing to consult with and advise hunters of small or large game who may wish to make their interest in the Museum's work tangible in such specimens. The "study specimen" of a mammal consists of its skin and skull. Skulls alone of the larger mammals form valued additions to the collections, making possible the accurate mapping of animal distributions and the study of their variations. Such skulls often form a by-product of a hunting expedition that can be acquired for the Museum with little additional expense or trouble. With a little more effort, skeletons (which need merely be "roughed out" and dried) can be obtained. It is perhaps not easy to realize how many gaps remain to be filled in the Museum's collections. An ideal reference collection with all known forms of life represented is beyond actual attainment, but the staff is in fact indefatigably engaged in the addition of missing forms and in the addition of materials especially desired for study. Not long ago, in connection with the identification of animal bones for archaeologists, it was realized that the Museum did not have a single complete skeleton for study (except a mounted one on exhibition) of the common Virginia deer.

It is thought that other members of the Museum besides Mr. Shirk (who has been a member for more than twenty years) may be encouraged to consult the Museum staff as to gaps in the collections and as to desired specimens. It is perhaps not necessary to add that the enlistment of active interest in the Museum on the part of its members and patrons still represents a major need of the institution. —K.P.S.

THIS MONTH'S COVER

An exhibit of which the Museum is especially proud is the restoration of a luxuriant forest of the Coal Age (250 million years ago) in Ernest R. Graham Hall of Historical Geology (Hall 38). Our cover shows only a part of this large diorama; another part appears in an illustration on page 3. The scene represents an area now known as Mazon Creek, Illinois, near Morris, about 65 miles south and west of Chicago. The reconstructions of trees, plants, and animal life of the Pennsylvanian era are based on fossils. The giant dragonfly in the center of the picture had a wing spread of about two feet. The exhibit was prepared some years ago under the supervision of Dr. B. E. Dahlgren, then Chief Curator of the Department of Botany (now Curator Emeritus). Technicians in the Museum's Plant Reproduction Laboratories worked several years on the diorama, the background was contributed by the late Staff Artist Charles A. Corwin, and cooperation was extended by scientists in the Museum's Department of Geology, the University of Chicago, the United States National Museum, the American Museum of Natural History, and other institutions.

(The cover picture is copyrighted by the Museum.)

Expedition Collects Plants in Central America

Mr. Paul C. Standley, Curator of the Herbarium, reports that the expedition he has been conducting in Nicaragua and Honduras has located a large number of plants previously unrecorded from those countries. He has been collecting recently in parts of Nicaragua where the rainfall attains 225 inches annually. Among the interesting trees found by him in Nicaragua are a rare Costa Rican species *Lecythis costaricensis* of the monkey-pot family and a species of hackberry (*Celtis*) related to one in the United States but previously not known south of Guatemala. At present he is in Honduras.

Harris Extension Gets New Trucks

The N. W. Harris Public School Extension recently retired the two trucks that have carried its traveling exhibition cases to the schools of Chicago for the last thirteen years and replaced them with two new one-half-ton panel models. Special body interiors, with tiers of shelves for efficient handling of the Harris Extension cases, are being built in the trucks by Museum carpenters. The old trucks each had approximately 70,000 miles of service on the school circuits at the time of their retirement.

NEW MEMBERS

(June 16 to July 15)

Associate Members

John Albert Appleton, Harold L. Hoefman

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Fossil Collecting Near Chicago . . .

COAL-AGE PLANTS AND ANIMALS OF THE BRAIDWOOD AREA

By EUGENE S. RICHARDSON, JR.
CURATOR OF INVERTEBRATE FOSSILS

MOST of the inhabitants of large cities are too concerned with other matters to devote much attention to the aspect of their countryside in the far-distant days before the appearance of man and his problems. Nevertheless, an interest in the fossil remains of our long-extinct predecessors brings many thousands of people to the Museum every year to see our collections. Some of these people, indeed, collect fossils in or near the city and bring them here to learn their names and history. Chicago is almost unique among large cities of this country in being built on bedrock containing an abundant fossil record of the life of millions of years ago.

Beneath the cover of gravel, sand, and clay left here by the ice sheet that 25,000 years ago moved most of Canada's soil down south of the border is the bedrock on which Chicago is built, a hard dolomite of Silurian age (about 375,000,000 years old) deposited in a sea that teemed with living things in and around great submerged reefs. Fossils weathered or broken from this rock are often found in quarries or on the city beaches.

Within fifty miles of the Loop, one may collect fossils of Ordovician, Silurian, Devonian, Pennsylvanian, and Pleistocene age (*see table*). An exhibit showing where to find the rocks of these various ages will be seen in Hall 37 (Frederick J. V. Skiff Hall) when it is opened following the current reinstallation of the cases.

Photograph copyright Chicago Natural History Museum

ANOTHER PART OF THE CARBONIFEROUS FOREST DIORAMA

This section adjoins that depicted on the cover. Note the giant cockroach on tree at left—in those days these creatures grew to lengths up to three and one-half inches.

One of the most rewarding near-by areas for those wishing to collect fossils is on the southern edge of the imaginary fifty-mile circle around Chicago. There, strip-mining operations have dug up the bedrock shale lying above a vein of coal (the so-called No. 2 Coal) and have left it, in great piles of clay and broken rock ("spoil heaps") 50 feet high, beside the cuts from which the coal has been removed.

From this area, bounded by Wilmington, Braidwood, and Coal City, and reached from Chicago by U. S. Highway 66, Museum parties and amateur collectors have for many years brought back fossil plants and animals of the coal swamps of Pennsylvanian time (about 250,000,000 years ago). For an even longer time—since 1857—similar fossils have been collected from the bed of Mazon Creek, a tributary of the Illinois River a few miles southeast of Morris.

TABLE

Period	began, years ago
Pleistocene	1,000,000
Tertiary	75,000,000
Cretaceous	110,000,000
Jurassic	175,000,000
Triassic	200,000,000
Permian	240,000,000
Pennsylvanian	280,000,000
Mississippian	310,000,000
Devonian	350,000,000
Silurian	380,000,000
Ordovician	450,000,000
Cambrian	540,000,000

NODULES BY THE BUSHEL

The gray shale removed from above the No. 2 Coal quickly weathers to a brown or buff clay when exposed in the spoil heaps, and in about ten years becomes covered with small trees and weeds. But in the interval during which the heaps lie bare, the fossil collector finds happy hunting, for the shale contains numerous concretions or nodules (*see illustration*). These are spheroidal bodies formed by the deposition of iron compounds, within the shale, surrounding a core of some foreign material, very commonly a fossil. When the shale crumbles to clay in the open air, the concretions, being harder, remain intact, and one may pick them up by the bushel from the surface of the spoil heaps.

A sharp blow with a hammer on the narrow edge of the nodule should split it open, revealing a fern leaf or animal fossil as the center. The ferns are represented by a very accurate impression in the fine-grained rock covered with a film of carbon, the residue of the plant tissues, the other ingredients having been slowly distilled away over millions of years of burial. The

A NODULE OR CONCRETION

It has been split open by a hammer blow, disclosing as the core a leaflet of the seed-fern Neuropteris.

animal fossils are less common and are usually not carbonized.

In the last nineteen years, Mr. George Langford, Assistant Curator of Fossil Plants on the Museum staff, has collected more than 500 different species of plants and 100 species of animals in nodules from these spoil heaps. Thus we know that the swamps

Drawing by Curator Richardson

'NUT-CRACKING' FOR SCIENCE

A collector cracking nodules in the field. He uses a flat-faced hammer, holding the nodule edgewise on a convenient stone "anvil." He has thoughtfully brought along a galvanized pail to carry home the nodules that contain good fossils.

from which the Illinois coal was derived were unusually rich in life forms as compared with even present-day swamps. The plant remains range from tiny spores and ferns to pieces of the trunks of large tree-ferns and club mosses. The animals include horseshoe crabs, mussels, shrimp-like forms, millipedes, insects, spiders, and fishes. The climate in which they all lived was warm and humid, with shallow fresh water underfoot, probably moving sluggishly toward the sea that then covered the Missouri and Kansas region. Overhead were tall fern-like trees, such as may be seen in the famous diorama of a coal-swamp forest in Ernest R. Graham Hall (Hall 38), shown on the cover of this BULLETIN and on page 3.

BEST SPECIMENS NOT SHOWIEST

Since new or rare species of plant and animal fossils are continually being discovered in the Pennsylvanian nodules of the Braidwood area, it is highly desirable that anyone collecting in that area should have his specimens identified and should make some provision for depositing the scientifically valuable material in the Museum. Let him who wants to build a collection of his own be not alarmed that he will lose it in this way, however. The scientifically important nodules in his cabinet will most likely not be those that are the most spectacular to look at. Experience has shown that the showiest specimens belong in general to the commonest species; the rare ones are very frequently thrown away by the amateur collector without even being taken home.

THE MUSEUM AND STUDY OF LIVING PEOPLES

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

As part of the program of research and exhibition carried on by the Department of Anthropology, one of the Museum's major interests has been in ethnology—the study of the cultures of living peoples.

Ethnology is often supposed to be restricted to the observation of primitive peoples only, as these existed in their native state, unaffected by contact with the western world. However, there are few if any groups left that remain completely undisturbed by the expanding industrial civilization of Europe and America. If ethnology is only the study of primitive peoples in their pristine state, then its subject matter has almost disappeared.

Ethnologists, however, do not accept this limitation of their field. It is perfectly true that they have concentrated attention on the lesser-known, often technologically primitive, peoples of the world. The reason for this is to be found in the broad comparative framework in which anthropological study proceeds.

BROAD AS THE EARTH

Anthropology, of which ethnology is a subdivision, is oriented around the conviction that man and his works should be observed and studied wherever man, or evidence for his former presence, is to be found. The proper study of mankind is as broad as the earth and extends as far back in the corridors of time as the evidence permits. In implementing this approach, ethnologists concentrated on those living peoples of the world about which little or nothing was known. They concerned themselves with learning more about exotic groups, some of them possessors of only the simplest techniques with which to make a living, others with an advanced technology and a sophisticated art. Great museum collections illustrating the native cultures of Africa, Oceania, Asia, Australia, and the Americas were established in the urban centers of Europe and America.

In the relatively short span of its existence, ethnology has been able to block out the major indigenous cultures of the world. Through the continuous improvement of its exhibits, this Museum has as one of its jobs to show the diversity of form and the essential characteristics that the world's cultures display, in order that we may deepen our perspective of man in relation to his culture and come to understand better the variety of culture types that have been associated with human groups over the earth.

So far, we have emphasized two things about ethnology: its comparative nature and its interest in men wherever they live. These prompted the sending of ethnological expeditions to isolated places. Although the native cultures of even the most remote peoples now have been affected by the expansion of western civilization, there is no sound reason to believe that humanity the earth over will soon be the possessors of a uniform culture. There will remain great blocks of peoples in Asia, Africa, and the Pacific whose cultures will continue to be very different from our own.

'AREA STUDIES'

At the moment one of the major interests in research and teaching in universities is in foreign "area studies"—the thorough understanding of a major world area with its human population and its culture. The prominence of the United States in world affairs demands a wider knowledge of the people of such major areas if our relations with them are to be in any degree satisfactory to us and to them. Ethnology is particularly suited to the furtherance of such area studies.

In striving for a fuller understanding of the historical relations of peoples the world over, ethnology joins hands with archaeology and documented history. Ethnology has been a major contributor to one of the principal demonstrations that anthropology has made: the importance and nature of culture—that entity consisting of a traditional heritage of meanings shared in by a society. And it has developed the comparative method in its techniques for showing the stuff of which cultures are made and wherein they differ. It has striven for objectivity, so necessary for understanding.

This contribution of ethnology to foreign area studies is not merely academic. With the conclusion of World War II, the United States assumed the responsibility for the administration of the ex-Japanese Mandate in the Pacific, consisting of most of the islands of Micronesia. Yet in this country little was known of the people who lived there. Accordingly in 1947 and 1948, a program of ethnological research, in which the Museum participated, was conducted in Micronesia to find what the cultures of the area were like—in what ways they were similar and how they differed. The information obtained will be of use not merely to anthropologists but also to the administrators of the area, who must have a basic knowledge of the people if administration is to be successful.

SOCIAL ANTHROPOLOGY

Growing out of the comparative nature of ethnology there has also crystallized a special interest, which has come to be called social anthropology. The aim of social

anthropology is not so much the descriptive study of the diverse cultures of the world, or of establishing their particular historical connections, as in defining and testing more general propositions concerning the nature of man and culture. Social anthropology is only in the process of becoming established and its formulations are still preliminary. Like all of anthropology, its point of view is comparative.

If we are to know the nature of man's family organization, then the family systems of societies the world over must be contrasted and compared. If we are to understand economic systems, we must compare the different motivations that lead men to work and to save, and the utilization of wealth in different societies. If we are to understand the processes of culture change, a hypothesis derived from the examination of one culture must be tested against comparable situations in other cultures. Finally, social anthropology is essentially empirical. The student must go into the field and observe at first hand—whether it be to the Eskimo, the Maya, the Solomon Islanders, the Chinese, or modern America that his problem leads him.

As a result, we find that ethnology is not to be defined by its particular subject matter as much as by its approach and problems. Anthropologists have studied modern communities in the United States, as well as in Ireland, Mexico, Africa, and the Solomon Islands. The internal organization of a factory has been found to be susceptible to the same methods of investigation as a Melanesian village. There is today a growing field of applied anthropology in industry.

As ethnology grows and matures, its goals and methods likewise change. It remains, however, comparative and empirical. In its development, it owes much to museums, for they have sent expeditions into the field and have supported ethnological work at home. Chicago Natural History Museum has sent ethnological expeditions to the Philippines, Madagascar, New Guinea, East Africa, Micronesia, Labrador, and British Honduras—to give but an incomplete list. The knowledge that these expeditions have gained has been diffused to the public through the medium of scientific publications and through exhibits and associated activities. Like the field work itself, the popular presentation of the results of such research is being constantly improved, in order to present a more intelligible picture of the history and nature of man and his works.

GENETICS, PALEONTOLOGY, AND EVOLUTION

For some years there has been a strong movement for the reintegration of sciences that had had separate and specialized development. The unifying intermediate sciences that have grown to independent status, such as physical-chemistry and biochemistry, have been peculiarly fruitful of results. The splitting of the atom and the crystallization of viruses are spectacular, but these successes represent only a small part of the scope of the new sciences.

Among the various biological sciences, specialized independent development had also reached an extreme by the end of the 19th century, and the new science of genetics has had a remarkable growth since that date. Within the Museum, the separation of zoology and botany and of the various divisions of systematic zoology illustrate this "isolationism." The movement for bringing these sciences together under the heading of *ecology* is one of the most promising directions of interest for the museum of the future.

Of all the unifying ideas, that of *evolution* touches the materials of museum exhibition and museum research most closely. The anatomy pursued and presented in museums is essentially comparative anatomy, with a main thread of interest in the evolution of its subject matter and close and direct relations with paleontology. Paleontology, in turn, depends directly upon neozoological source material but has evolution, both as the major panorama of life on the globe and the development of minor individual groups, as its theme.

This is by way of introduction to explain the Museum's legitimate pride in its participation in the fine volume of essays, *Genetics, Paleontology, and Evolution*, published by Princeton University Press and resulting from the distinguished international conference under the same title held at Princeton in celebration of that university's bicentennial anniversary. Four members of the Museum staff were invited guests of Princeton University, January 2–4, 1947, to take part in the symposium that constituted the main purpose of the conference. These were Dr. Theodor Just, Chief Curator of Botany, Mr. Bryan Patterson, Curator of Vertebrate Paleontology (Department of Geology), Mr. D. Dwight Davis, Curator of Vertebrate Anatomy (Department of Zoology), and Mr. Karl P. Schmidt, Chief Curator of Zoology. One of the most effective aspects of the conference, however, consisted in bringing together the leading scientists engaged in systematic zoology and botany, paleozoology and paleobotany, and the whole field of genetics, with a series of younger men who had given promise of careers in scientific research.

The essays by the Museum staff in the distinguished volume now at hand are "Some Aspects of Plant Morphology and Evolution" by Dr. Just, "Comparative Anatomy and the Evolution of the Vertebrates" by Mr. Davis, and "Rates of Evolution in Taeniodonts" by Mr. Patterson. The appearance of these names on the attractive jacket of the book constitutes the kind of public recognition of its role in modern science that the Museum most needs.

KARL P. SCHMIDT
Chief Curator of Zoology

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

Mr. Edward E. Ayer, first President of the Museum, retired from this post in 1899. He continued to serve the Museum with unceasing interest, and the older members of the staff remember his visits made in a wheelchair nearly to the time of his death. Mr. Ayer is remembered for his contributions to the exhibition halls and for the notable Ayer Library of Ornithology.

THE SOMALI WILD ASS GROUP
Now on exhibition in Carl E. Akeley Memorial Hall (Hall 22).

In 1899 Carl E. Akeley completed and installed the Somali wild ass group, an exhibit that illustrates clearly his exceptional artistic talents. Hitherto, taxidermists had too often turned out specimens that, while anatomically correct, appeared lifeless and wooden. The fine line of demarcation between artist and craftsman in taxidermy is shown in the Somali wild ass group. Art students, especially, will be interested in noting the different attitudes and expressions that make for the individuality of each of the animals.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum during the last month:

Fieldiana: Zoology, Vol. 31, No. 30. *A New Species of Tinamus from Peru.* By Boardman Conover. June 30, 1949. 4 pages, 2 text figures.

Anthropological Series, Vol. 30, Part I, No. 2. *The Anthropology of Iraq. The Lower Euphrates–Tigris Region.* By Henry Field. July 8, 1949. 202 pages, 180 plates, 4 text figures, 2 maps.

Adventures Afield . . .

THE QUEST FOR PLANTS

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

WHAT makes the search for plants and animals so fascinating and important? It is a well-known fact that each species of plant and animal is found in a certain circumscribed area and thus has a definite range of geographical distribution. But many people, unaware of this fact, see a plant or an animal in one place and automatically assume that it should be found elsewhere. This is not true, except in the case of domesticated plants and animals and those found in botanical and zoological gardens. Wild species are found only in certain definite places, usually within a limited range, as natural conditions have eliminated them from some regions and restricted them to others.

Without natural curiosity man would never have progressed beyond a certain stage of development. This is particularly true in the field of natural science. Surrounded by innumerable plants and animals of different kinds, man has gradually, through the ages, learned to distinguish many of them. Yet he has not yet found all living and extinct species of plants and animals. Each scientific expedition to areas not previously collected or at best only superficially studied brings back numerous species new to science and/or new to the locality in which they were found.

Since collecting plants and animals thus adds to the sum total of human knowledge, collecting trips are very important. Of course, the geographical limits of some of the larger trees, like the coast redwood, or of big animals, like the African elephant, are well known, as are the natural ranges of many common plants and animals. But the geographic distribution of many plants is still poorly known and much exploration in the United States and elsewhere is needed.

DISCOVERIES NEAR HOME

Many years ago (1872) Reverend E. J. Hill wondered about what was growing on Altorf Island, an island in the Kankakee River, northwest of Kankakee, Illinois. He had the good fortune of finding a member of the mallow family growing naturally on the island. When the plant was studied, it proved to be a new genus and species, now called *Ilyamna remota*. Except for what appears to be an introduced or escaped colony, growing along a railroad cut near East Paris, Indiana, this particular plant is found nowhere else in the world. A related plant has been found in the past twenty years on Peters Mountain, Virginia. Both the Virginia and Illinois plants are related to a genus of western plants, known as *Sphaeralcea*. Such a discovery poses many problems of plant evolution, relationships, and geographical distribution.

In the early part of this century, Miss Norma Pfeiffer, then a student in botany at the University of Chicago, found in a bit of natural prairie in the south part of Chicago a tiny plant that lacked the normal green coloring matter (chlorophyll). At the time no one knew what it was, but careful study of its flowers revealed it to be an undescribed species belonging to the tropical genus *Thismia* of the Burmannia family (*Burmanniaceae*). All previous collections

COMMON SPICE-BUSH
Branch of Lindera Benzoin, with attached leaves and fruit.

made by numerous explorers in other parts of the world had shown that this family inhabited only tropical and sub-tropical regions. In the United States the previously known northern limit of the family was Virginia. The nearest place to Chicago where another species of *Thismia* occurs is in Panama. Thus thousands of miles separate these two localities of two related species. Incidentally, the Chicago plant has never been found since. Yet its discovery gave evidence of the former presence of a member of a tropical flora within the Chicago area.

NEW 'LIVING FOSSIL'

During the past two years, a "living fossil," called *Metasequoia* and closely related to the present-day redwood and big tree (*Sequoia*), was found in China. For thousands of years this tree, well known to the natives of the region in China where it is found, has been growing unnoticed. Meanwhile its fossil relatives had been found and described in Japan. This discovery of living trees of what was thought to be an extinct fossil plant is a remarkable example of the great surprises in store for the careful collector.

Another interesting example of how plant collecting fills important gaps in our geographical knowledge is exemplified by a lucky find I made recently. The word "lucky" is used advisedly, since of all the localities I might have selected in Missouri in October, 1948, for botanizing, I hit upon one that I had never previously visited but that, judging from a study of topographical maps, promised to have a swamp flora. The place selected was in Ripley County, southeastern Missouri. Only a few miles distant, cotton gins were rumbling away with activity of a busy town. Since the place was close to houses and a town, I didn't expect very much in the way of interesting plant life. Most of the timber had been cut away from the small knobs of the region and the land plowed under for cotton, beans, and watermelon. I kept walking, however, until I found my way to more densely wooded areas. Here, in a series of small rolling knobs and depressions, I decided to "botanize" (look for plants).

As it was late in October, many plants were bearing fruits. In one wooded depression I suddenly spotted some scarlet fruits. Approaching these colorful objects, I realized that I was unfamiliar with the plant. Standing beside the plant, I saw that it was a low shrub with drooping, conspicuously veined leaves and large scarlet fruits. Then I saw hundreds of the same plants occupying the depression. All I could think of was spice-bush (*Lindera Benzoin*), a common shrub of the eastern states. Grasping some of the leaves and fruits, crushing and smelling them, I determined that they had an odor resembling spice-bush but much more like that of sassafras. Looking more closely, I found that the fruits were larger and borne on longer fruiting stalks than spice-bush, that the leaves were of an entirely different shape, texture, and venation, and that the plant was much smaller in comparison with the usual size for spice-bush.

SOMETIMES JUST LUCK

Recalling accounts I had previously read about another kind of spice-bush (*Lindera melissaefolia*), I thought that I had discovered this kind. But how interesting the find actually was I could not know until my return to Chicago. Curiosity had taken me to this spot. I had had remarkable luck in finding the plant, as I might have been wandering around in other parts of the state that same October day. Yet here was a new find. Soon I saw other colonies of the plant in other depressions near-by, and a farmer, with whom I conversed later about it, was well acquainted with it. He called it pond-berry. Now, just how important was it and what did it contribute to our previous knowledge?

Upon returning to Chicago Natural History Museum, I studied the characters of the pressed plants I had collected. Yes, indeed, it matched the description and the *single* specimen in our herbarium of *Lindera melissaefolia*. But was this shrub really rare? Some of the plant manuals credited this shrub both to Missouri and Illinois. However, a previous study had shown that all the Missouri and Illinois material and much from other states had been wrongly identified and should have been classified as a hairy variety of the common spice-bush. In order to complete the study, it was necessary to borrow material of *Lindera*

melissaefolia from the principal herbaria in the United States. Actually, all the largest herbaria of this country had only 10 properly identified different collections of *Lindera melissaefolia*, and most of these had been made about 100 years ago. Only two collections have been obtained during the present century. In Alabama this rare shrub has not been collected for more than 100 years. Although Thomas Walter described the original collection of the plant from South Carolina in 1788, it has to this day remained a very rare shrub.

All these years the plant has certainly been growing in Missouri in the bottom lands of the Mississippi Embayment of the Gulf Coastal Plain part of the state, but it was not discovered until 1948. Several hundred miles now separate this station from the known nearest locality in Alabama. And without an actual collection of it preserved in a herbarium, no one would be able to state factually that it occurs in Missouri. Such a discovery reveals how much remains to be done, even in Missouri, where active botanical collecting has been carried on for more than a hundred years. This is not an isolated example. Numerous discoveries of similar nature continue to come to light with new explorations of any given region. Missouri is but a small sector of the world and will continue to yield valuable discoveries through continued exploration. By comparison, how much may be found in the rest of the world, especially in many parts of the tropics! Filling in important gaps in plant distribution is as significant and exciting as mapping an uncharted bit of wilderness in some unexplored sector of the earth.

Such experiences impress the scientist and all lovers of nature with the need for conservation of as much wild land as possible. Only by retention of and exploration of natural areas will new and startling data be yielded concerning plant and animal distribution.

Entomological Field Trip

Mr. Henry S. Dybas, Assistant Curator of Insects, will leave early in August with two companions on an insect-collecting trip in the southeastern states, from Alabama and Florida to the Appalachian Range. The purpose of the project is to obtain a large collection of insects of species that live on fungi and to recover, if possible, one that has not been reported since 1860. This "lost species" is one of the smallest of known beetles. The field trip will be made with the motor carryall of the Department of Zoology.

Visitors interested in minerals will find valuable information in two companion cases, "Classification of Minerals" and "Physical Properties of Minerals," in Hall 34.

HOW HERMIT CRABS SOLVE A HOUSING SHORTAGE AND UTILIZE PROPERTY INHERITANCE PRINCIPLE

By FRITZ HAAS
CURATOR OF LOWER INVERTEBRATES

An example, in the animal world, of a housing shortage and its solution, as well as an example of lower animals utilizing the principle of inheritance of property in the form of dwellings, is provided by the hermit crabs, especially by a large terrestrial hermit crab of the West Indies and a large part of Latin America.

An extreme case of hermit-crab housing shortage results from the extinction of a large snail whose shells are inhabited by the crabs, which are not provided by nature with their own habitation. The inheritance is due to the housing shortage—when a crab that has obtained a fossil snail shell dies, another crab installs itself in the same shell, and thus they pass the shell down from generation to generation.

A very conspicuous inhabitant of all the West Indies, from the Bahamas in the North to Dominica in the South, and of the coast line of North, Central, and South America from Key West, Florida, to Brazil is the large terrestrial hermit crab that indeed has become so independent of the ocean that it is often seen far away from the beaches and even high up on hills. The name of this rather aberrant crustacean is *Cenobita diogenes* Latreille. Like all hermit crabs, this species shelters its soft abdomen in snail shells. In accordance with its stately size, only large snail shells can serve this purpose. In all the localities of its wide distribution, the crab is mostly seen carrying around the heavy, trochoid shell *Livona pica* Linnaeus, which is very abundant throughout that area.

CRAB INHERITS SNAIL'S ESTATE

Lacking a home of its own, the hermit crab, Cenobita diogenes, installs itself in the shell of a snail of the species Livona pica.

In Bermuda, the aptly named *Cenobita diogenes* is still abundant though at the northern limit of its range. There are no fresh *Livona* shells in Bermuda to serve as hermit-crab houses; but fortunately for our hermit, the Pleistocene and even more recently extinct *Livona* left abundant fossil and subfossil shells in the aeolian sandstone deposits that compose the higher ground of the Bermudas. These are excavated by the hermit crab and used quite in the same way as are the more recent shells elsewhere. Without this supply of large shells, there would not be nearly enough large snail shells for the Cenobitas of Bermuda.

The marine shell *Livona* flourished in Bermuda waters and apparently became extinct there in glacial times. *Cenobita diogenes* also lived on the Bermuda beaches in preglacial times and used the *Livona* shells to house its soft abdomen then as now. In fact, the abundance of fossil *Livona* shells in the Bermuda sandstone can only be accounted for by the fact that the hermit crabs carried the shells up to all levels while the sands were being blown up and deposited by the winds of the glacial era. Thus the Cenobitas survived the extinction of their house-producer because the activities of their own ancestors had laid up a store of solid shells.

Everywhere in Bermuda one sees the hermit crabs with their *Livona* shells, small and large according to age, in gardens and on the heath-covered hillsides. There are abundant empty *Livona* shells scattered about, and there can be no doubt that one and the same shell has often served as house for long successions of hermit inhabitants.

Fossil Collecting Expedition

Dr. Sharat K. Roy, Chief Curator of the Department of Geology, will leave shortly for the field to collect invertebrate fossils, chiefly in New York State. He will be assisted for part of the time by Mr. Orville L. Gilpin, Chief Preparator. The objective is to collect specimens required to illustrate the marine-group dioramas that at present are being installed in Frederick J. V. Skiff Hall (Hall 37).

Audubon Society in Museum

The Illinois Audubon Society now has its headquarters in the Museum offices of its president, Dr. R. M. Strong, Research Associate in Anatomy. Two other members of the Museum staff, Dr. Austin L. Rand, Curator of Birds, and Mr. Emmet R. Blake, Associate Curator of Birds, are members of the society's board of directors. Meetings of the group are usually held in lecture rooms of the Museum.

TWO CHILDREN'S MOVIES OFFERED IN AUGUST

The Raymond Foundation will present the final two summer motion picture programs for children on the first two Thursday mornings in August. There will be two performances of each program, the first beginning at 10:30 A.M. and the second at 11:30.

The entertainments will be given in the James Simpson Theatre of the Museum. Children are invited to come alone, accompanied by parents or other adults, or in groups from clubs and various centers. Admission is free. Following are the dates and titles of the films:

August 4—WIND FROM THE WEST

A story, both fact and fantasy, from the land of the Lapps.

Also a cartoon.

August 11—THE ENCHANTED FOREST

The adventures of a little boy in a friendly forest.

A COLLECTION OF BIRDS RECEIVED FROM PERU

Around the turn of the century large collections of Peruvian birds, many of them new to science, were being received in Europe from Mr. Jean Kalinowski, one of the best-known Peruvian collectors. A collection of birds, also from Peru, has arrived in Chicago Natural History Museum, forwarded by Mr. Celestino Kalinowski, a son of the early collector. The Museum is particularly pleased with this collection, not only because of the scientific interest of the birds and the excellence of their preparation but also because Mr. Kalinowski was one of several foreign students who have come to this Museum in recent years to study museum methods and to prepare themselves for further work in their own countries. The present collection represents the first fruits of Mr. Kalinowski's labors since his return to Peru.

The locality where Mr. Kalinowski is now working, Marcapata in the Department of Cuzco in southeastern Peru, is of particular interest. On the eastern slope of the Andes, it has the fringe of the great tropical Amazonian jungle below, not more than twenty miles to the eastward, while close above it the mountains tower up to 15,000 feet. Almost all the major life-zones of South America can thus be reached within a day's journey, and an amazing variety of birds is in easy reach. Since this part of southeastern Peru has been comparatively neglected by previous collectors, it should produce many novelties to a careful collector.

A most surprising new species has already been found in the first collection from Mr. Kalinowski. It is one of the large tinamous, a group in which no new species have been discovered in the last eighty years. Although new species are discovered from time to time among smaller and less well-known families of birds, it is most unexpected to find new forms among the larger game birds, which are eagerly sought not only by collectors but by the natives for food.

The collection as a whole contains many birds of general as well as scientific interest. Perhaps the most beautiful of these are the tanagers of the genus *Tangara* and its closer relatives. Brilliant reds, greens, yellows, and blues are mixed in a seemingly endless variety of patterns. Both males and females, for a change from the rule in the bird world, share in the flashing plumage. Some are brilliant blue below with purple throats, bright green heads, and red backs; others are yellow below with bright blue and black patches above. Clearly marked as each species is, the effect of many birds together is bewildering in the variety of pattern.

With such an excellent beginning to his collecting in Peru, it is hoped that Mr. Kalinowski will continue his work in this interesting locality and further enrich the collections of the Museum.

MELVIN A. TRAYLOR, JR.
Research Associate, Birds

STAFF NOTES

Dr. Alexander Spoehr, Curator of Oceanic Ethnology, is conducting a class in oceanic art in the summer school of the Art Institute of Chicago. Class meets regularly at the Museum and the course material is based on the extensive Pacific ethnology collection in the Museum.... **Dr. Fritz Haas,** Curator of Lower Invertebrates, has been elected president of the American Malacological Union.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Miss Gladys Larsen, Chicago—3 flint axes (Neolithic), Denmark.

Department of Botany:

From: Dr. Richard Evans Schultes, Cambridge, Mass.—224 herbarium specimens, Colombia; Eizi Matuda, Escuintla, Chiapas, Mexico—560 herbarium specimens, Mexico; Llewelyn Williams, Randolph, Wis.—trunk of wax palm (*Ceroxylon quinduense*), Colombia; Dr. Martin Cardenas, Cochabamba, Bolivia—276 herbarium specimens, Bolivia.

Department of Geology:

From: Dr. Rainer Zangerl, Chicago, and C. M. Barber, Flint, Mich.—collection of fossil reptiles and fossil fish, Alabama; Eugene S. Richardson, Jr., Winnetka, Ill.—a Silurian cephalon, *Dalmanites platycaudatus*, Illinois; Eagle-Picher Research Co., Joplin, Mo., and Cincinnati, Ohio—18 samples of lead and zinc products, and an exhibit case containing lead and zinc pigments and oxides; Lorin Clark, San Francisco, Calif.—3 stromatolite specimens, Michigan.

Department of Zoology:

From: Boardman Conover, Chicago—9 miscellaneous bird skins, Brazil; Dr. C. L. Frame, Asheville, N.C.—a mounted sailfish; Dr. José Cuatrecasas, Chicago—a snake, Colombia; Walter Buchen, Chicago—203 bird skins, eastern Africa; Miss Margo Owans, Chicago—16 specimens of marine shells, Cebu, Philippine Islands; Bryan Patterson and Allen Patterson, Chicago Heights, Ill.—15 frogs and a lizard, Florida; Loren P. Woods, Richton Park, Ill.—2 fish skeletons; Ross Tarrant, Wilmette, Ill.—a set of fishing tackle and a set of laboratory instruments; Bernard Benesh, Chicago—a frog, a lizard, a snake, and 4 salamanders, Tennessee; Gordon Thurow, Chicago—2 lizards, Bermuda; Walter J. Eyerdam, Seattle, Wash.—8 non-marine shells, South America; Alfred C. Weed, DeLand, Fla.—28 miscellaneous fish skeletons; Dr. Alvin R. Cahn, U. S. Army—4 adult salamanders, and a series of larva salamanders and salamander eggs, Japan; Lincoln Park Zoo, Chicago—a mammal specimen, India.

Library:

From: C. Aldred, Royal Scottish Museum, Edinburgh; Dr. Henry Field and U. S. Department of State, Division of Libraries, Washington, D.C.; Dr. Ernest Mayr, American Museum of Natural History, New York; Karl P. Schmidt, Homewood, Ill.; and G. de Caso Ridaura, Spanish Consul, and Harry Hoogstraal, both of Chicago.

AUGUST LECTURE TOURS GIVEN TWICE A DAY

During August, conducted tours of the exhibits, under the guidance of staff lecturers, will be given on a special schedule, as follows:

Mondays: 11 A.M., Story of Plants—Basis of All Life (general survey of the plant exhibits); 2 P.M., General Tour (exhibition halls, all departments).

Tuesdays: 11 A.M., Places and Peoples (general survey of the anthropology exhibits); 2 P.M., General Tour.

Wednesdays: 11 A.M., Records from the Rocks (general survey of the geology exhibits); 2 P.M., General Tour.

Thursdays: 11 A.M. and 2 P.M., General Tours.

Fridays: 11 A.M., The World of Animals (general survey of the animal exhibits); 2 P.M., General Tour.

There are no tours given on Saturdays and Sundays.

Are you acquainted with the Museum's Popular Series of Publications? Written for laymen and printed in convenient pocket size, these cover a wide variety of subjects in anthropology, botany, geology, and zoology. Price list on request.

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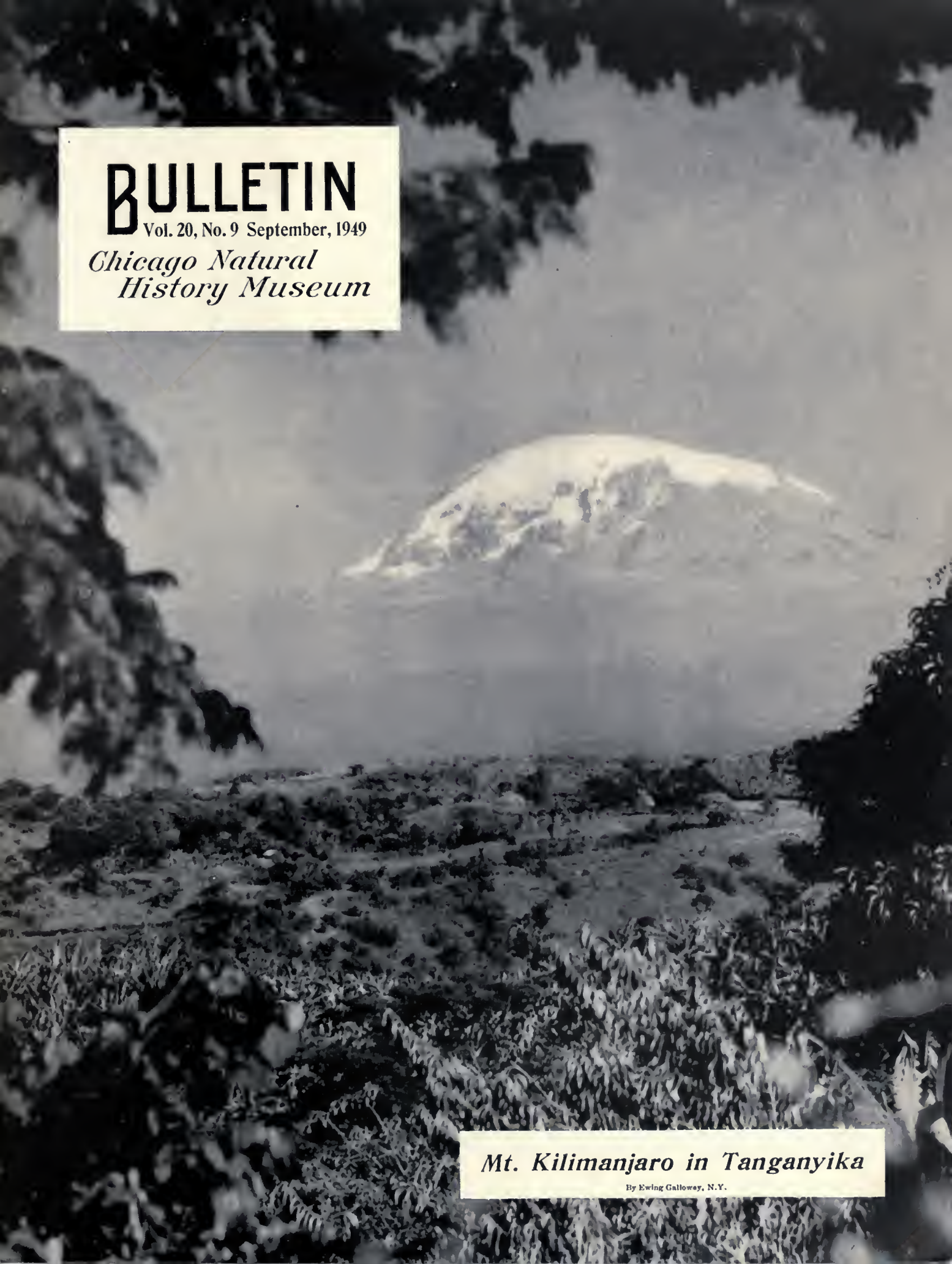

Mt. Kilimanjaro in Tanganyika

By Ewing Galloway, N.Y.

Chicago Natural History Museum

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CLIFFORD C. GREGG ..... *Director of the Museum*

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SHARAT K. ROY ..... *Chief Curator of Geology*
KARL P. SCHMIDT ..... *Chief Curator of Zoology*

MANAGING EDITOR

H. B. HARTE ..... *Public Relations Counsel*

Members are requested to inform the Museum promptly of changes of address.

A NEW BUCHEN COLLECTION

The interest and generosity of Mr. and Mrs. Walther Buchen of Chicago are helping the Bird Division of Chicago Natural History Museum toward one of its aims—that of having in its collection a complete representation of the birds of the world. Last year when the Buchens returned from a hunting trip to East Africa they presented to the Museum an extremely interesting collection of birds from Mount Kenya. While in the Museum, looking at our East African material and discussing African field work, Mr. and Mrs. Buchen became interested in filling the gaps in our East African collection. A correspondent of theirs in Nairobi, Kenya Colony, a noted authority on East African birds, might be able, they thought, to help us get some of the species we lacked. They asked us for a list of the birds of East Africa that were not represented in the Museum collection.

The list when made up numbered some 400 species from Kenya and Uganda. Some were known from but a single specimen, some were great rarities, some came from remote corners of the colonies, and the status of some was in doubt. It was a formidable list and one not easily filled. But hopefully we sent it to Mr. Buchen.

On June 2 of this year we received from Nairobi a box of bird skins for which Mr. and Mrs. Buchen had arranged. It contained 203 specimens of 109 species and subspecies. We have as yet done little more than list the material and note that at least 25 of the kinds are new to our collection, hitherto unrepresented, that there are rarities, and that there are series of topotypes that will be of great value in future taxonomic work. This is indeed a picked collection. Such a way of completing a collection—a way that provides just the specimens we need—is the sort of arrangement that happens only too rarely, but when it does it comes as the fulfillment of a museum curator's dream.

Discoveries will be made as the collection is studied. In an earlier number of the BULLETIN we mentioned a little grassland warbler known as Hunter's cisticola, in the previous Buchen collection, which looked as though it would repay study. We were not mistaken. A scientific paper entitled "Altitudinal Variation in the African Grass Warbler, *Cisticola hunteri*," has been prepared on this and published. Part of the interest in the problem centered on the further evidence of altitudinal variation. It was known that on Mt. Kilimanjaro, in Tanganyika Territory, Hunter's cisticola was pale at lower altitudes and became progressively darker at higher altitudes, until at 12,000 feet the bird was quite different in color. With the aid of the Buchen material it was demonstrated that the same variation happened on Mt. Kenya, more than 200 miles to the north in Kenya Colony.

But of further interest was the fact that high-altitude birds on Mt. Kenya were indistinguishable from high-altitude birds on Mt. Kilimanjaro. There seems little doubt that on each mountain the dark high-altitude birds evolved directly from the pale populations at the base of each mountain, and this is proved by the persistence of birds of intermediate coloration at intermediate levels.

A nice problem in nomenclature, in the applying of names, arose. The paler lower-altitude birds were obviously all one subspecies, despite their range consisting of many scattered areas. But could these two high-altitude populations, indistinguishable in appearance but separated by 200 miles or more and with another subspecies between them, be included under one subspecific name? Names should indicate relationships and they should also call attention to certain types of phenomena.

From the point of view of history, one high-altitude population did not arise from the other, and each high-altitude population is more closely related to the birds at the bases of the respective mountains than to each other. But from the point of view of how rather than when they arose, these two populations developed from similar ancestral populations, under similar conditions, and in similar manner, to give end products so similar they are indistinguishable. It was decided that despite their being the products of parallel evolution both should be included in one dark-mountain subspecies, with a discontinuous range.

This illustrates what happens to a collection when it is received in the Museum. It is unpacked, accessioned, arranged, and catalogued. Then it is compared with other material in our collection, and the literature is searched to find what has been written about these birds. Perhaps nothing new emerges, and then the specimens are filed away in our cabinets to await some future occasion when they may be needed. But sometimes, as in the present case with the Buchen material, facts and ideas that are new to the scientific world are discovered and the collection thus yields further knowledge about how the forces of nature have acted on the manifestation of life that we call birds.

AUSTIN L. RAND
Curator of Birds

THIS MONTH'S COVER

The cover presents an unusual view of the highest mountain in all of Africa, Mt. Kilimanjaro. It is about 19,500 feet high and, although it is less than 4 degrees from the equator, it possesses an icecap and several large glaciers. Mt. Kilimanjaro and the near-by Mt. Kenya dominate the big-game fields of British East Africa. From this area were obtained the birds received by the Museum from Mr. and Mrs. Walther Buchen, of Chicago (the collection is described on this page). The photograph, by Ewing Galloway, of New York, is used through the courtesy of Mr. and Mrs. Buchen.

MR. AND MRS. WALTHER BUCHEN
On ground is an eland, largest of African antelopes.

SOUTHWEST EXPEDITION CLEARS OUT 'HOUSE OF MYSTERY'

By PAUL S. MARTIN
CHIEF CURATOR, DEPARTMENT OF ANTHROPOLOGY, AND LEADER OF THE EXPEDITION

TUCKED away deep in a forest of New Mexico on a narrow peninsula between two convergent stream beds, one of which still carries water, is an ancient hamlet. It was occupied about the time that William the Conqueror was invading England, or possibly as early as A.D. 950, and abandoned probably by A.D. 1100. Because this pueblo has revealed so many curious and unexplainable features, members of the Southwest Archaeological Expedition of Chicago Natural History Museum sometimes call it the "house of mystery."

For weeks the staff of the expedition and a crew of six local diggers have been heaving rocks, picking dirt the consistency of concrete, chopping down trees, and struggling to clear the debris of a thousand years that had accumulated in the rooms of this ancient village, now officially called "Leggett Pueblo." Leggett Pueblo contains six rooms, all built on top of the ground.

In previous seasons the staff of the expedition has investigated with greatest care the "civilizations" of earlier times—"civilizations" that flourished at A.D. 800, 600, 400, and 3000 B.C. The Indians who occupied these earlier villages did not live in surface houses with stone walls but in underground or subterranean units called "pit houses." A pit house is a hole (perhaps 12 feet in diameter and 3 feet deep) covered by a roof of timbers, poles, branches, and sod.

But here in Leggett Pueblo the diggers have found the first village made up of contiguous rooms with masonry walls built *on top of the ground.* Its walls are made of crude boulders and pebbles. This primitive masonry is the earliest in the area and therefore has been dubbed "dawn masonry."

The average visitor might be disappointed upon gazing at these rooms now carefully cleared of the debris that had choked them for centuries. But if he could realize that he is looking at the remains of one of man's earliest efforts to pull himself upward, to improve his status, his home, and his general living conditions, the visitor would truly marvel.

The archaeologists have discovered in the rooms corn-grinding mills, stone axe-heads, hammer stones, and bone awls. Also, *under* the walls of one room, four whole pottery bowls were found. Just why they were under a wall no one knows.

Associated with Leggett Pueblo is the big puzzle—a deep pit that so far is an archaeological headache. The floor of this irregularly shaped pit is about 7 feet below the surface and is small in area, having a diameter of about 6 feet. At one side of the pit is a series of "steps" by which one can descend to the lowest levels. Around the walls of this excavation is a row of small round holes that seem to have been sockets in which roof beams were inserted. The archaeologists cut fresh beams to fit these sockets and thus were able to reconstruct, in a general way, the roof pattern and to visualize its appearance.

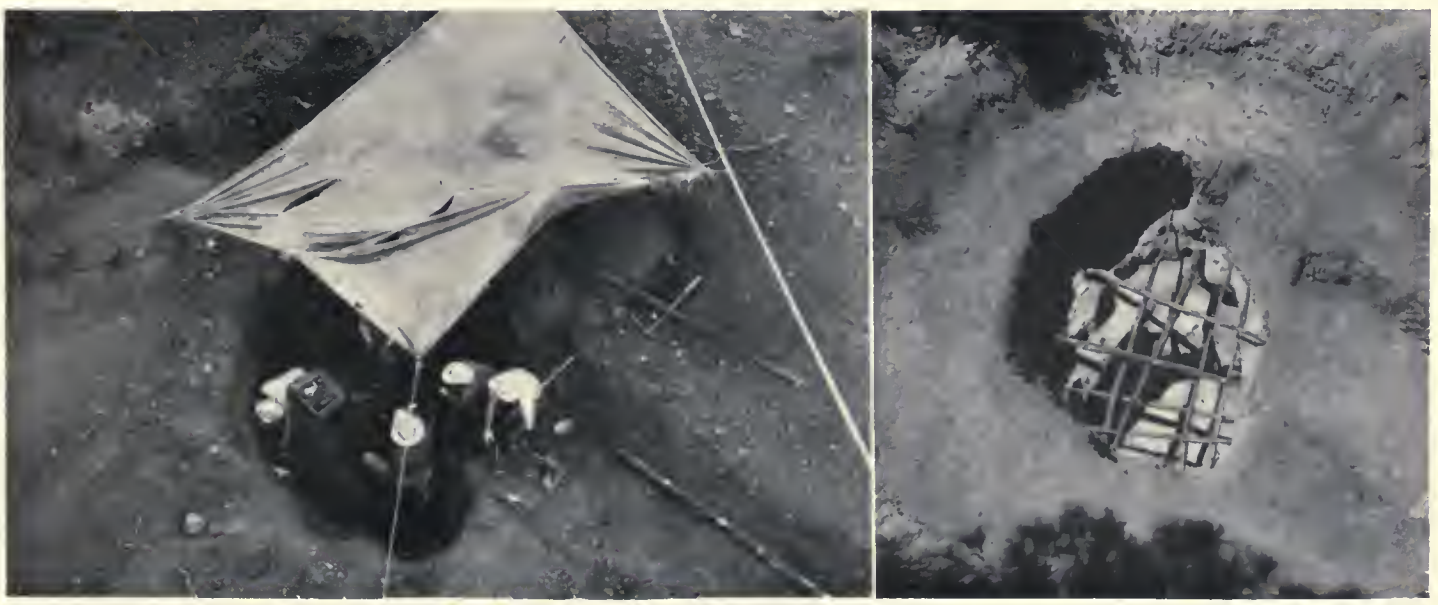
But what was the function of this pit? Several guesses have been advanced to explain the former use to which the structure was put. Among them are:

(1) A ceremonial room—although it is a bit small for this use; (2) a food-storage pit—the ash layer might represent burned corn that had been stored there; (3) a "walk-in well," the water for which was furnished by a now-dry spring—gravel on the floor of the pit lends some soundness to this conjecture; (4) a turkey pen—four completely articulated turkey skeletons and parts of another were found, as well as bits of what may be eggshells; (5) a cooking pit or a place for curing meats—several stones that had been subjected to great heat and several rather thick layers of ashes lend credence to this supposition; (6) a very early Cochise house—i.e., a house that was dug and occupied by the earliest settlers of this area, the Indians of the Cochise culture, who lived here about 5,000 years ago without benefit of agriculture or pottery (discovery two seasons ago of the remains of this culture in near-by Wet Leggett arroyo was reported in the BULLETIN).

There is little positive evidence for believing that this pit is a 5,000-year-old Cochise house, but, on the other hand, there is no strong negative evidence against the opinion. The only reason for entertaining the idea that this is the earliest house yet found in North America is that no other explanation seems to be so satisfactory: it is close to Wet Leggett arroyo along which we have found 5,000-year-old tools and Cochise tools have been found in a trench near Leggett Pueblo and under a "sterile" stratum.

Probably the question will never be settled finally unless more and similar pits can be found. One thing is certain—this pit is unique.

Further work is under way in another small village. Several such villages will be dug this season and next, in order that the archaeologists may be sure that they have discovered all the important elements of this time period, called the Reserve Phase, which dates from about A.D. 100–1100.



ARCHAEOLOGISTS FIND MYSTERIOUS PIT

Left: Diggers excavate mysterious pit near Leggett Pueblo. Right: View of pit from photographic tower shows possible reconstruction of roof.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

DAYS WITHOUT TIME, Adventures of a Naturalist. By Edwin Way Teale. Dodd, Mead and Company, New York, 1948. 283 pages, 270 illustrations. Price $6.

Edwin Way Teale's new book, *Days Without Time*, is a book for all who enjoy the out-of-doors. It will recapture happy hours and experiences when all pressure of deadlines and need for clock-watching had disappeared and "sun time and wind time" sufficed. It will bring back hours of relaxation and pleasure in observation of the ordinary and yet remarkable events that take place constantly in the natural world around us.

Mr. Teale is a trained naturalist. He is experienced in observation and he knows what to look for and where and when, and yet you follow along with him easily in this delightful book, which is a series of adventures, observations, and walks in the out-of-doors. It seems so easy, as you read along, that you wonder why you didn't observe all these things yourself. Soon you become anxious to go back to similar situations so that you can watch these amazing events. You missed so much before, and there is so much to see.

Each chapter in the book is an independent story. You may dip in and begin at any place. Each chapter is full of bits of information about all kinds of natural things that you and I could see often if we had the time, inclination, and patience. But here Mr. Teale goes further. He explains why and how these events occur and gives simple answers to the questions that inevitably come to mind. He describes in detail interesting habits of insects, birds, reptiles, and mammals, and activities of plants. Such observations and explanations are difficult to find in most books. For instance in the chapter on "Green Fire" he tells how many plants, such as skunk cabbage, generate heat as they grow and how at times the temperature increase is great enough to soften frozen ground and melt snow. When the skunk cabbage makes its early spring appearance the "green fire of spring has won its first victory." A clump of grass becomes a small island of life as Mr. Teale focuses your attention on the intriguing activities going on constantly. You find yourself astonished at the insects found sleeping in comparative safety there and you chuckle with delight as Mr. Teale tells about finding a black ant so sound asleep that it had to be tapped three times with a grass blade before it awakened, when it stretched and even yawned.

Days Without Time is a delight to photographers. It is illustrated with 144 of Mr. Teale's photographs—each beautiful in detail and composition. Here again, the charm of the out-of-doors is brought to you by a trained observer and photographer who knows where to go and how to take the pictures that tell the story of natural events occurring right around us.

This is a book to savor a little at a time, to reread as you relive your own happy hours away from the clock, re-examining your own observations and beginning to understand them better. Perhaps more than anything else, to me the book becomes an urgent invitation to go frequently to my own favorite spots so that I may see again and with more open eyes these simple and miraculous events in the out-of-doors.

MIRIAM WOOD
Chief, Raymond Foundation

AMERICAN WILD FLOWERS. By Harold N. Moldenke. D. Van Nostrand Company, Inc., New York, 1949. 453 pages, 64 plates (32 in color). Price $6.95.

This profusely and beautifully illustrated volume, prepared by Dr. Harold N. Moldenke, Curator of the Herbarium at New York Botanical Garden, fills a gap in popular botanical literature. Of the approximately 32,000 species of flowering plants estimated to grow wild in North America north of Mexico, 2,050 are included in the present work.

Hitherto, other books on wild flowers have dealt with plants from certain sections or states of this country or Canada. This has naturally limited the use of such works beyond the areas covered by them. Dr. Moldenke's book, on the other hand, treats the showiest and some of the most interesting wild flowers found from coast to coast and from Canada to Mexico. Thus it will satisfy the needs of those nature-lovers who, in traveling from one section of the country to another, wish to have such a general reference work at hand.

This is an excellent book for the beginner, for its fifty chapters are filled with a wealth of interesting material. Each chapter is devoted to a particular family or related families of plants and includes a general description of the plants, data on time of flowering, geographical distribution, and use, as well as general information. At the beginning and end of each chapter are selected pertinent quotations from famous authors, such as "Nature reads our labels, 'great' and 'small'; Accepts she one and all," from John Vance Cheney. These quotations help to make this very readable book even more enjoyable.

The common names used follow the latest (1942) edition of *Standardized Plant Names*. For each group of plants discussed, the reader is introduced to the great diversity of the plants belonging to it and also given a general idea of its evolution. The book begins with a chapter on buttercups and their relatives and ends with another on orchids. As each chapter is a unit in itself, the reader may safely use the book as an authoritative reference work in addition to reading it for pleasure from cover to cover.

This book should be in every nature-lover's library. It will round out that part of his library so far lacking a general reference work on American wild flowers.

JULIAN A. STEYERMARK
Associate Curator of the Herbarium

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: Dr. Hilda H. Heller, Arequipa, Peru—a stone club head, probably Inca, Peru.

Department of Botany:

From: Donald Richards, Chicago—500 specimens of mosses, Czechoslovakia; Dr. Earl E. Sherff, Chicago—108 herbarium specimens, Hawaii.

Department of Geology:

From: Mrs. E. M. Bell, Trinidad, Colo.—a fossil bow-fin fish, of the family *Amiidae*, Colorado.

Department of Zoology:

From: A. P. Hermann, Joliet, Ill.—3 specimens of sea shells, Midway Island; Chicago Zoological Society, Brookfield, Ill.—a Lesser panda and a Cape hartebeest, Asia and Africa, and 29 birds; Dr. Hans Schlesch, Copenhague-Bispebjerg, Denmark—17 freshwater shells, Paraguay; John W. Schmidt, Plainfield, Ill.—3 snakes and 8 salamanders; John Mungo, Chicago—a two-headed pigeon squab, Chicago; C. Deuquet, Oatley, Australia—5 beetles, Australia; Mrs. Frank Shapland, Kankakee, Ill.—a butterfly chrysalis, with 50-plus emerged parasitic wasps, Illinois; A. J. Franzen, Chicago—a snake, Wisconsin; Mrs. L. H. Gist, Chicago—a European goldfinch; F. G. Bard, Regina, Canada—5 snowshoe rabbits, Saskatchewan, Canada.

Library:

From: Col. Clifford C. Gregg, Valparaiso, Ind.; D. Dwight Davis, Richton Park, Ill.; Karl Sax, Cambridge, Mass.; and Société des Missions Evangeliques, Paris, France.

Raymond Foundation:

From: John Wiley and Sons, Inc., New York City—a set of 163 kodachrome duplicate 2 x 2 slides on historical geology, in a special box.

Change in Visiting Hours

On September 6, the day after Labor Day, autumn visiting hours, 9 a.m. to 5 p.m., go into effect, continuing until October 31.

SEPTEMBER LECTURE TOURS, DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., Sept. 2—Plants and Animals through the Ages. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Sept. 7—Plant Pioneers (*Miriam Wood*).

Fri., Sept. 9—Animals that Help Man. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Sept. 14—The Earth's Story (*Anne Stromquist*).

Fri., Sept. 16—Fibers, Feathers, and Furs. Illustrated introduction in Meeting Room (*Marie Sroboda*).

Wed., Sept. 21—China: People and Customs (*June Buchwald*).

Fri., Sept. 23—All that Glitters—Gold, Silver, and Uranium Ores. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Sept. 28—Plants and Industry (*Marie Sroboda*).

Fri., Sept. 30—Animals without Backbones. Illustrated introduction in Meeting Room (*Lorain Farmer*).

There will be no tour on Saturday, September 3, and Monday, September 5, on account of the Labor Day week-end holiday, but the Museum will be open.

NEW MEMBERS

The following persons became Museum Members between July 18 and August 15:

Associate Members

Mrs. E. M. Bowman, Reamer G. Loomis, Edward J. Stephani.

Sustaining Members

Harry D. Crooks

Annual Members

Michael E. Addison, Richard M. Bennett, George C. Bouris, H. S. Bowles, Lawrence A. Carton, David C. Cook III, Dexter Cummings, R. J. DeMotte, Joseph Homan, Vitus J. Houha, George A. Hutchinson, Jr., Egbert G. Jacobson, A. William Johnson, G. H. Kellogg, Forest R. Lowrey, Eugene K. Lydon, Frank J. Meistrell, P. T. O'Connor, James J. O'Sullivan, Dr. Jerome B. Reich, David J. Reilly, Thomas G. Robinson, Anthony M. Ryerson, Roy W. Siemund, Edwin C. Sittler, Leo N. Soule, Clement F. Springer, A. Mac Thompson, Thomas S. Tyler, Steven S. Tyrakowski, Herman T. Van Mell, Rousseau Van Voorhies, C. J. Weiler, Dr. H. R. Weinzimmer, J. H. Young, E. W. Zimmerman.

Audubon Society Lectures

The Illinois Audubon Society has arranged with Chicago Natural History Museum for the presentation of its free public lectures in the James Simpson Theatre of the Museum during the coming season. The Society's lecture season runs from October to April and the subject matter is confined to wild life, primarily birds. All of the lectures will be illustrated by colored motion pictures.

The first lecture of the series will be presented on Sunday afternoon, October 2, at 2:30 o'clock, when Mr. Karl A. Maslowski, noted wild-life photographer, will present "Beneath Buckeye Skies." Members and friends of the Museum are invited. There is no charge for admission.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum recently:

Fieldiana: Zoology, Vol. 31, No. 31. *A New Ant-Thrush from British Guiana.* By Emmet R. Blake. July 29, 1949. 2 pages. $0.10.

Geological Series, Vol. VII, No. 7. *The Mapleton Meteorite.* By Sharat Kumar Roy and Robert Kriss Wyant. July 29, 1949. 14 pages, 10 text figures. $0.40.

STAFF NOTES

Mr. Donald Collier, Curator of South American Ethnology and Archaeology, and **Mr. George I. Quimby,** Curator of Exhibits in Anthropology, will attend the 29th International Congress of Americanists in New York City, September 5–12 .... **Dr. B. E. Dahlgren,** Curator Emeritus of the Department of Botany, left early in August for a botanical field trip in Cuba. He will be away from the Museum approximately two months, during which time he will study and collect palms .... **Dr. Earl E. Sherff,** Research Associate in Systematic Botany, plans to visit Guatemala this month in search of the famous "tree dahlia" that grows wild there .... **Dr. Sharat K. Roy,** Chief Curator of Geology, is conducting a collecting trip in Paleozoic formations of upper New York State to look for invertebrate exhibition material for Hall 37. Dr. Roy was accompanied by **Mr. Orville L. Gilpin,** Chief Preparator of Fossils, who returned from the field in August .... **Mr. Eugene S. Richardson, Jr.,** Curator of Fossil Invertebrates, has left on a trip to the western states. He will collect fossil plants in Oregon, Washington, Idaho, and Montana as well as investigate reported occurrences of vertebrate and invertebrate fossils in those and other western states .... **Dr. Robert H. Denison,** Curator of Fossil Fishes, returned late in July from a three-month field trip in Arizona, Utah, Wyoming, and Colorado. His collections are largely of the earliest fossil fishes of Ordovician and Devonian age .... **Mr. Frank C. Wonder,** Staff Taxidermist, returned late in July from the Museum's Rush Watkins Siamese Expedition because of illness. **Mr. Colin C. Sanborn,** Curator of Mammals, reports from the field that he and Mr. Watkins have rearranged their plans to go to peninsular Siam in the hope of obtaining tapir. .... **Mr. Harry Hoogstraal,** Field Associate, who represents the Museum's staff in Africa while employed by the U. S. Naval Medical Research Unit No. 3, reports from Cairo an auspicious beginning of the current year's work. Mr. Hoogstraal will be stationed at Torit in the Anglo-Egyptian Sudan, where he will entertain a succession of specialists on parasite-borne diseases and of other scientists who have special knowledge of the host animals.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

In 1899 the Honorary Members of the Museum numbered four. They were: Charles B. Cory, Edward E. Ayer, Mary D. Sturges, and Harlow N. Higinbotham. The five patrons were: Allison V. Armour, Willard A. Smith, Frederick J. V. Skiff, William I. Buchanan, and Frederick W. Putnam.

One of the installations of 1899 was a glass-enclosed case of Stone's Mountain Sheep. This variety of sheep, although common and now well-known in northern British Columbia and neighboring parts of Canada, was not discovered until 1897.

STONE'S MOUNTAIN SHEEP

The group was later reinstalled by Julius Friesser and a background painted by Charles A. Corwin. The exhibit can be found in George M. Pullman Hall (Hall 13) at the entrance to Richard T. Crane, Jr., Hall (Hall 16).

TAPIRS: STRANGE MAMMALS NATIVE TO ASIA AND TROPICAL AMERICA FROM MEXICO SOUTH

By PHILIP HERSHKOVITZ
ASSISTANT CURATOR OF MAMMALS

THE clumsy animal known as the tapir looks like something put together from parts left over from donkey, elephant and swine. Its size and closely cropped mane are comparable to those of a donkey. In bodily proportions and short legs, shape of head and small eyes it resembles a pig. The nose and upper lip of the tapir are joined and extended into a flexible proboscis which, though only a few inches long, is precisely

SOUTH AMERICAN TAPIRS

Part of habitat group in Hall 16. The specimens were collected in 1926 by the Marshall Field South American Expedition.

comparable with the elephant's trunk. Oval-shaped ears and a stub of a tail complete the general outline of the tapir.

Tapirs, together with members of the horse and rhinoceros families, compose the modern order of Perissodactyla, or odd-toed hoofed animals. The tapir has four toes on each forefoot and three on each hind foot. However, just as in the horse, the main axis in both the fore and hind leg is a line running through the middle of the third and largest toe. The tapir has lost only the first toe, corresponding to the human thumb, on the forefoot, and the first and fifth toes have disappeared from the hind foot. Thus, the foot of the tapir represents a condition found in very early ancestors of the modern horse.

WIDELY SEPARATED HABITATS

There are four kinds, or species, of tapir, all closely related and classed in the genus *Tapirus*. Three species variously distributed in tropical America, from southern Mexico into southern Brazil and Paraguay, are the largest indigenous land animals south of the United States. The fourth species, the Malay tapir, lives in distant Burma, Siam, French Indo-China, the Malay States and Sumatra. Were it not for investigations nto the past history of the earth, this remarkable instance of discontinuous distribution between American and Asiatic tapirs would be difficult to explain. We know now that in past epochs tapirs abounded over considerable portions of the northern hemisphere. Adverse climatic conditions, combined with the rise of ever more powerful carnivorous animals, caused the extinction of tapirs except for the few survivors that wandered southward into their present widely separated habitats.

Existing species show little difference in size and are alike in bodily proportions. A fully mature individual measures from 6 to 6 feet 6 inches in a straight line from tip of nose to base of tail and stands between 3 and 3 feet 3 inches high at the shoulder, a little higher at the rump. The weight of the animal is anywhere between 400 and 700 pounds. Tapirs are comparatively long-lived. A Brazilian specimen lived 27 years in the National Zoological Park, Washington, D.C., and died at the age of 32.

American tapirs range in color from light brown to blackish brown with the cheeks, throat and chest grayish, and the ear tips gray or buffy. The Malay tapir is striking in its particolored pattern. It is blackish brown on the forepart of the body from head to shoulders and on the limbs, while the remainder of the body including the rump and upper parts of the thighs are gray or white. The ear tips are also whitish as in the American species.

ENORMOUS FOOD CONSUMPTION

These nocturnal, shy, retiring and inoffensive animals are heavy eaters. They gorge themselves with grass, leaves, stems, roots, young twigs, fallen fruit and almost anything else including snakes, insects and grubs. They are fond of mud containing saline solutions. Apart from their predilection for watermelons, they hardly trouble the farmer. The amount of food consumed in one night is enormous and, together with the water imbibed, may vary from one-seventh to one-fifth the total weight of the animal.

The tapir is solitary and only during the brief period of courtship are two found together. Birth is given to one young at a time about every two years. The average period of gestation is between 13 and 14 months. The young tapir, which perhaps should be called a colt, could be mistaken at first sight for an unusually large young pig. Its coat is beautifully variegated with spots and stripes of yellow and white over a brown ground color. The expert would find it difficult to distinguish one species of tapir from another on the basis of the hide alone of very young individuals. Young taken alive by natives become tame from the first day of captivity and develop a strong attachment to their living quarters, rarely leaving them voluntarily even after reaching maturity. The voice of the tapir is a shrill whistling cry.

HABITAT AND DEFENSE

The animal selects its territory with extreme care, preferring a heavy thicket for a daytime retreat and a bordering field, marsh or river bank covered with lush vegetation for nightly foraging. A body of water is important in the domestic economy of the tapir, for the mammal drinks frequently and copiously, loves to bathe at dawn and to lie in the soft cool mud at nightfall. Besides, the stream or lake, even if reduced to a swamp, is the tapir's citadel of defense and means of escape from enemies. On anticipating danger, the tapir hurtles itself into the nearest body of water where it may swim far from the enemy or, if cornered, stand at bay, menacing with a butt of the head, a nip of the front teeth and, especially, a gash from the short but strong tusks. On land the heavy body and short thick limbs prevent the tapir from making good use of its hoofs for kicking and slicing but in water or marsh it can outmaneuver an aggressor obliged to divert the use of its limbs to swimming or struggling through muck. The extraordinarily thick hide of the tapir, the first line of defense, resists all but the most powerful claws and fangs of the predator. Thus the only important natural enemy of the Malay tapir is the tiger while the jaguar and puma are significant persecutors of American species. If pounced upon by one of these great felines, the tapir rushes headlong through the thickest underbrush, weaving and passing through narrow and intricate places in an attempt to brush off the cat.

HUNTING THE TAPIR

The Malay tapir is hardly or not at all hunted by man. It is surrounded with native superstitions and protected by the governments of most of the countries it inhabits. The flesh resembles horse-meat in color, texture and flavor and is not highly regarded by Asiatics. Moslems disdain it because they believe the tapir is a species of swine. On the other hand, nearly all tribes of American Indians esteem tapir meat. Usually, one Indian sets out with dogs for tracking down and flushing the pachyderm out of hiding while a companion conceals himself in a canoe or along the edge of the nearest body of water. From the cries of the dogs and the crash of a heavy body splintering a path through the thickest jungle, the waiting hunter can judge where the tapir will emerge to plunge into the water and stand at bay. During the time the cornered tapir is busily engaged in fending off a pack of swimming dogs the Indian with his deadly weapon arrives upon the scene. However, the Bororó Indians, who compose the bulk of the population

of the Brazilian Matto Grosso, regard the tapir with awe and never kill it.

USED IN CHARMS, MEDICINES

Besides its value for food, Indians hunt tapir for the hoofs, which, it is believed, possess strong preventive and curative powers against epilepsy. The hoofs are strung and worn as amulets or may be hung over the fireplace to protect the entire family. As a cure for epilepsy, the nails of the toes are ground down and taken in powdered form. For pneumonia, the medicine man may prescribe the powder mixed with skunk liver. An old Inca formula for curing malaria is the powder ground together with three roasted lice, then boiled in a solution of cacao and taken internally.

Tapirs offer little in the way of trophies to the sportsman. A skull or the hoofs with the hide of the foot converted into an ash tray are about all that might interest the trophy collector. The thick hide is difficult to prepare and usually spoils before it reaches the tanner. The leather is too brittle when dry and too limp when wet for making shoes but can be carved into thongs, whips and bridles. Also, the untanned hide is sometimes formed into a large rigid chest the size of a wardrobe trunk. During the Spanish conquest, it was noted that soldiers of the organized armies of the Inca empire used shields of tapir hide.

LATE IN BECOMING KNOWN

In spite of their size, abundance and importance in native economy and superstitions, tapirs were surprisingly late in becoming known to the scientific world. The first species to receive a technical name was the Brazilian or crested tapir. Its name, *Tapirus terrestris*, dates from the great Linnaeus' tenth edition of the *Systema Naturae* published in 1758, the starting point of zoological nomenclature. Actually, the species was made known to Europeans two and one-half centuries earlier, but many naturalists, including Linnaeus himself, doubted the very existence of such an animal.

YOUNG SOUTH AMERICAN TAPIR
Its striped and spotted coat is characteristic of many juvenile animals.

It was not until 1816 that zoologists became aware of the Malay tapir and the name *Tapirus indicus* was applied in 1819. The existence of the third species, the unusually hairy and comparatively small tapir of the Andes of Colombia and Ecuador was first brought to the attention of scientists in 1829. Its discoverer proposed for it the name *Tapirus pinchaque* because he wished to associate this tapir with the "pinchaque" of native legends, a large fabulous animal that may have been the now extinct mastodon. For a long time the Central American tapir had been regarded as identical with the Brazilian species. It was not until 1870 that a naturalist examined a skull and discovered that it was different from all others. He named the species *Tapirus bairdii* in honor of the then secretary of the Smithsonian Institution, Spencer Fullerton Baird. The term tapir, borrowed from the language of the Tupi Indians of Brazil, means "large animal."

GROUP IN MUSEUM

The adult specimens in the Museum habitat group of the Brazilian tapir were obtained in Matto Grosso in 1927 by Mr. Colin C. Sanborn, Curator of Mammals. The striped and spotted young from the same region was secured and contributed to the group by Mr. Sascha Siemel. A large male and female of Baird's tapir collected in British Honduras in 1923 by Staff Taxidermist Leon L. Walters and Chief Curator Karl P. Schmidt (then Assistant Curator of Reptiles) provide the only complete skeletons of this species in the Museum.

Three expeditions of Chicago Natural History Museum are covering this year some of the territory inhabited by each of the four known kinds of tapirs. The Rush Watkins Siamese Expedition, though primarily concerned with birds, may have an opportunity to bring back specimens of the Malay tapir. Personnel of the Guatemala Zoological Expedition have traversed the haunts of Baird's tapir. Their interest in securing insect parasites of mammals may lead to collecting a tapir host. The leader of the Colombian Zoological Expedition may find representatives of the Brazilian tapir in the headwaters of the Orinoco River and will attempt to secure a specimen of the extremely rare hairy tapir in the high altitudes of the Colombian Andes.

All lost articles found in the Museum are sent to the service counter at the Main (North) Entrance, where they are held until they are claimed.

A lounge where smoking is permitted is located at the center of the north corridor on the ground floor. Photo-murals on the walls of the lounge illustrate stages in the growth of the Museum and the nature of its expeditionary work.

BIRDS FROM ALGERIA

The true dividing line between the birds of Europe and the birds of Africa is the Sahara Desert and not the Mediterranean Sea. In northwest Africa there are mountains. In some parts there are forests of oaks and conifers, vineyards and olive orchards and fields of grain, as well as arid and rocky terrain. This is more like the country to the north of the Mediterranean than like that south of the great Sahara. One would expect the birds from these areas to be more like those of England and France and Spain than like those of central and south Africa, and one would predict that they would be paler in plumage and represent subspecies different from those of northern Europe, the result of the blue skies and bright sunshine of the Mediterranean area as compared with the duller skies of the north.

This is well brought out by a collection of birds received at the Museum from M. Julien Laenen, of Brussels, Belgium. It comes from northern Algeria, with such exotic sounding place names on the labels as Camp des Chenes, Col de Ben-Chico, Berrouaghi, Chellala, and Ain-Sba.

The collection contains about 50 bird species. There are nightingales, blackbirds, spotted flycatchers, stone chats, chiffchaffs, goldfinches, greenfinches, and even a raven and a crossbill, birds one thinks of as being truly northern. At least 15 of them represent subspecies new to our collection.

Of course not all the species are European. A few, such as a dull-colored bulbul, are intruders from the African fauna to the south of the Sahara. And there are pale, sand-colored endemics, larks and warblers, which are found only in the north African area. At least three full species in the shipment are new to our collection.

M. Laenen writes that he has finished his collecting in northern Algeria and is leaving for the Haggar Mountains in the interior, where the country will be dryer and less friendly and the birds less known. We are looking forward to his further shipments that will add more new birds to our collections. —A.L.R.

Transportation to the Museum

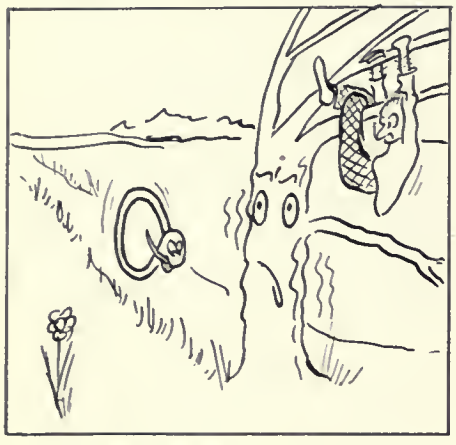
Service to the 14th Street entrance of the Museum is maintained by the Jackson Boulevard buses (No. 26) marked "Grant Park" on the front and by State Street–Soldier Field parking lot shuttle buses (No. 49—"Red Top"). The Illinois Central main and suburban stations are two blocks west of the Museum. The subway and certain interurban lines have stations at Roosevelt Road within a few blocks of the Museum. The eastern terminus of Roosevelt Road street cars is about one block west of the Museum. There are excellent drives for automobiles and free parking space.

A FIELD FOR PSYCHOLOGY—SNAKE STORIES

By CLIFFORD H. POPE
CURATOR OF AMPHIBIANS AND REPTILES

THE EDITOR of a sports magazine once told me that he would not publish a refutation of the mother-snake-swallowing-her-young-for-protection story because soon afterward he would be forced to employ a stenographer to answer innumerable letters of protest. This is good evidence that false beliefs about snakes die hard in spite of science education.

Among many such beliefs are a few perennials that deserve to be called the "Big Four" of snake mythology. In addition to the one already mentioned, I include the hoop-snake myth and the milk-snake and glass-snake stories. The milk snake is said to consume quantities of milk and even to



Cartoon by Margaret G. Bradbury

THE MYTHICAL HOOP SNAKE

Herpetologists scream there's no such thing, but millions still believe there is, and many will swear they have seen it.

milk cows directly, and the glass snake is supposed to join the pieces of its shattered body together again and crawl to safety. Then there are elaborations. The hoop snake, for example, is reported to bear a sting in the end of its tail and even to be able to stick this sharp instrument into a tree and cause the leaves to wither in a matter of minutes.

Comparison of these stories brings to light some interesting facts. First, they are very old, a datum that in itself suggests survival from a pre-scientific age. Second, they all involve action; that is, they describe things that snakes do. Since action cannot be preserved, it is relatively hard to prove or disprove. Third, with one exception, there is little difficulty in understanding how each belief arose. The milk snake lives about barns where both milk and rodents abound but has designs only on the latter, though it is remotely possible that a milk snake might actually drink milk from the cat's saucer. The glass snake, which happens to be a legless lizard superficially resembling a snake, has a long, fragile tail and thus may actually survive being broken in two pieces of equal length. The dismembered tail never becomes joined to the body again. In time a new tail grows, but it fails to attain the excessive length of the original. The story of the swallowing of the young by the mother snake might have arisen in many ways, among them casual dissection of a viviparous female about to give birth to living young or observation of a snake feeding on the young of another species with a similar pattern.

NARROW 'ESCAPES' TOLD

The method of locomotion of the hoop snake seems to rest firmly on the human imagination, although the stinging ability of this highly mobile creature is often used to connect it with a certain southern species that has a sharp tip to the tail and the habit of pressing this tip against a restraining hand. The connection is very tenuous since the snake with the sharp tail is not the fast-moving, active kind demanded by the story. Survivors of hoop-snake "attacks" agree that only a great burst of speed enabled them to escape a horrible death.

The reptile man is constantly confronted by "eye-witnesses" of these remarkable feats. His problem is to present evidence that truly convinces rather than makes the issue one of personal veracity or merely strengthens the narrator's conviction that scientists are pertinacious individuals who never admit to laymen they could be wrong.

If the herpetologist begins by telling all the reasons why it is "impossible" for a snake to, let us say, suck a cow but the narrator simply answers that it must be possible because he saw it happen, what is the unfortunate herpetologist to do? My experience convinces me that the best approach is first to point out how common the belief is. This cannot be denied, since almost everyone raised in the country has "seen" it take place. Moreover, all such persons have "seen" hoop snakes roll, glass snakes break up, and mother snakes swallow their young and give them up again. The narrator will freely admit all this and also that these must be very common events that happen thousands of times every year all over the country. If this be true the actions in question would lend themselves to ready demonstration, and it is inconceivable that such ordinary behavior would not be observed by reptile specialists or zoo keepers. How could men who spend their lives studying reptiles in the wild state as well as in laboratories or observing them in zoos fail to observe actions that every farmer witnesses over and over again? The shoe is now on the other foot, for the narrator has some explaining to do.

Perhaps his best rebuttal is that so many observers, even if they are laymen, could not be wrong. The answer is simple. What about the general belief that the "spreading adder" or "blowing viper" (called hog-nosed snake by herpetologists) is venomous? This belief, in contrast to the "Big Four" stories, can easily be disproved, for the herpetologist will allow himself to be bitten by a hog-nosed snake. He will probably have to force the snake to bite, since this species seldom does more than put up an appearance of doing so. Here is ample proof of the inaccuracy of lay observation of animal behavior, for a harmless creature that rarely even bites is considered a most dangerous snake.

After having thus turned the tables, the reptile man can judiciously point out some of the reasons why it is impossible for snakes to perform certain feats. Details of these reasons would take us too far afield into snake anatomy, physiology, and behavior patterns. They can be found in such recent publications as *The Truth About Snake Stories* by Chief Curator of Zoology Karl P. Schmidt and my *Snakes Alive*.

Should the narrator remain unconvinced, the herpetologist should now bring up the time element. In nearly every case it will be found that the particular event in question took place far away and long ago. This is true because the human mind cannot readily build up false recollections in a short time; only after years of hearing others tell of seeing certain things happen can a self-convincing mental image be made. An unusually long and detailed account that I recently received gave no clue as to the time of occurrence until near the end, when the statement that "I was too young to be a drinking man" inadvertently let the cat out of the bag and made the story fit the usual pattern.

'OLD—IT MUST BE TRUE'

The best snake letter ever received at Chicago Natural History Museum was written by an elderly man evidently convinced that age increases the validity of an observation. He began by telling of persons who had seen snakes perform one of these feats only a few years ago but went on and on to conclude with a second-hand account of an event about as hoary as the writer himself. He obviously felt that nothing more need be said.

At this point a psychologist should take over. A mere herpetologist can scarcely be expected to explain why the mind of man insists on conjuring up false images. Individual veracity has little to do with the matter; the ability is a universal one although it may be much more highly developed in some persons than in others. Since reading with dismay parts of my diary that had been put away for some twelve years I have had no illusions about my own case. The herpetologist will justly remain skeptical until the layman can say, "*There* is a mother snake swallowing its young for protection," not "When I was a boy in Florida I saw a mother snake swallow its young for protection."

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Chicago Natural History Museum

Chicago Natural History Museum

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Members are requested to inform the Museum promptly of changes of address.

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

NATURAL HISTORY OF MARINE ANIMALS. By G. E. MacGinitie and Nettie MacGinitie. McGraw-Hill Book Company, Inc., New York, 1949. xii+473 pages, 282 figures. Price $6.

All curiosity begins with the question "What is that?" Hence the first interest of people in general and of children especially, when they encounter an unknown, strange-looking creature on the seashore, is to know its name and its place within the hierarchy of animals or plants. Unfortunately, many people remain at this mental level all their lives. Though busy and proud in the gathering of a rich collection of various sea shells, for instance, they remain satisfied with the knowledge of the names of the shells and with the certainty that they possess most of the types of snail and clam shells found on a certain beach or coast. An entire literature has appeared to satisfy the desires of collectors of this kind. There are books devoted exclusively to the shells, or to the fishes, or to the birds of the East and West coasts of America, and there are even books that try to offer a general survey of the commoner and more conspicuous animals or plants of our coasts.

Helpful as these books doubtlessly are, they do not satisfy another and, fortunately, larger portion of interested people—those who want to know the life history and the role in its environment that a certain animal or a plant plays, and not just the name. Now here is the time for the scientists to confess publicly and sadly that very, very little is known about the ecology—the role in the household of nature—of even most of the commoner animals and that it is partly the fault of the scientists that the interested layman cannot find publications that would quench his thirst for deeper knowledge. Or it may be that there are some individual books published that deal with some of these questions, hut they probably are technical, full of scientific names and terms, and not understandable to the layman reader.

If two naturalists, then, who are living on the seashore, who have devoted decades of their lives to the study of the animal and plant life of their surroundings, and who, furthermore, have published important contributions to the ecological study of their domain—if such people combine their experience, knowledge, and technical abilities to write a book on marine animal life, there is a good chance that they will do an excellent job, that they will not only list the questions mentioned above but that they will try to answer them also. And that is what has happened in this special case.

The authors of *Natural History of Marine Animals* not only neatly formulate the questions that confront one studying the life of oceanic animals but they also give the respective answers where and when this is possible. They are not afraid to confess occasionally that an answer cannot yet be given, thus stimulating, perhaps, the interested reader to occupy himself with the still unsolved problem. All the text is plainly written, so that everybody can understand it. The authors can be congratulated that they succeeded in this without descending to the use of too many colloquialisms, a means many popular writers seem to think indispensable for attaining popularity.

Though living and working on the West Coast, the authors do not confine themselves to that region but equally mention and describe East Coast animals and interesting ones not found in any of the American seas. Thus the MacGinitie book may be called rightfully a "general natural history of marine animals." It is a book that, for its many merits, can be warmly recommended to all nature-lovers as a source of sound information about the habits and the life history of animals they may find on the beach today or tomorrow.

FRITZ HAAS
Curator of Lower Invertebrates

THIS MONTH'S COVER

Establishing the motif of the new Hall of Indian America (to be opened October 12), the design on this month's cover represents a Maya feathered serpent deity from a bas-relief at Yachilan, Mexico. The figure is reproduced among the exhibits in Case 30 of the new hall, Hall 4. It was executed by Mr. Gustaf Dalstrom, Staff Artist of the Department of Anthropology. Because the exhibits in this hall pertain to the Indians who inhabited North America before the arrival of Columbus (see article on page 3 by Dr. Alexander Spoehr), Columbus Day was selected for the formal opening.

FREE CHILDREN'S MOVIES ON SATURDAY MORNINGS

The Autumn Series of free motion-picture programs for children on Saturday mornings, presented by the James Nelson and Anna Louise Raymond Foundation, will begin October 1 and continue through November 26. All of these programs will be given at 10:30 A.M. in the James Simpson Theatre of the Museum. In addition to motion pictures, lecturers will appear on three of the nine programs.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

October 1—WONDERS IN YOUR OWN BACKYARD
Also a cartoon

October 8—PUEBLO BOY
Story of a Pueblo Indian boy

October 15—NORTH TO THE YUKON
From Wisconsin to Alaska
Talk by Cleveland P. Grant

October 22—LAND OF THE PLUMED SERPENT
Mexico
Also a cartoon

October 29—EUROPEAN CHILDREN
Swiss, French, Irish, Russian, and Polish

November 5—CHILDREN OF THE NEW WORLD
Americans all

November 12—SUWANNEE ADVENTURE
Story of the Suwannee River
Talk by Allan Cruickshank

November 19—ALONG SMOKY MOUNTAIN TRAILS
A cycle of the seasons
Talk by Peter Koch

November 26—SOUTH AMERICAN HIGHLANDERS
Also a cartoon

MUSEUM MEMBERS' RECEPTION OCT. 12 IN NEW INDIAN HALL

By ALEXANDER SPOEHR
CURATOR OF OCEANIC ETHNOLOGY

COLUMBUS DAY, October 12, has been chosen as a fitting occasion for the formal opening of the Museum's newest hall, "Indian America" (Hall 4). This latest addition to the exhibits of the Department of Anthropology presents a visual history of Indian civilization in North and South America from the time that man first crossed from the Asiatic continent into the New World to the era of rediscovery by Columbus and his fellow European explorers, conquerors, and missionaries.

The hall incorporates a number of distinctive features. In the planning of its exhibits, the cardinal principle followed has been to present the ideas of which history is made, rather than merely to store archaeological specimens in new cases. The Museum is an educational institution, not a curiosity shop. Every effort has been made to display specimens so that they convey a connected story of prehistoric man in the New World and show in a meaningful context the objects he used.

COLOR AND LIGHTING STRESSED

Exhibits should be pleasing to the eye as well as informative. Those in the new hall make full use of color, in order to bring out the best points in the objects shown and as a device to emphasize the most important aspects in the story of the Indian in America. Case lighting has vastly improved the illumination. Long labels for every object have been carefully avoided, but sufficient information is nevertheless included on labels to satisfy the interested visitor.

Finally, four model dioramas of prehistoric Indian villages—in the Southwest, Louisiana, Yucatan, and Peru—skillfully portray the life in typical communities in those areas. In each diorama, one can see a village in its environmental setting, with the distinctive architecture of its houses and public buildings and the activities of the local citizens as they go about their daily tasks.

The hall is divided into three sections. The first of these shows principal characteristics of New World civilization at the time Europeans were first exploring North and South America and recording what they saw. This section was completed and formally opened in 1943. At that time, the hall was located on the ground floor. It has since been moved to the main floor to make it more accessible to the public and put it in proper association with other exhibits dealing with Indians of the New World.

The opening of the Indian America Hall on October 12 will be a preview for the membership of the Museum and representatives of the press. Admission will be by invitation, and all Museum members will receive invitation cards. Actual opening of the hall will be at 2 p.m., and tea will be served from 3 to 5 p.m.

PERIOD BEFORE COLUMBUS

The second and main section is devoted to the historical development of Indian culture before the period of discovery by Columbus and other white men. Various areas of the New World are treated in turn, though emphasis is laid on North America, particularly eastern North America, as separate halls in the Museum deal especially with South America, Middle America, and the Southwest.

The exhibits dealing with the prehistory of eastern North America tell a story, by visual means, of the succession and development of Indian cultures or civilizations in the region. The earliest Indians were the product of a hunting, fishing, and gathering economy. Some of them were nomadic but others, because of the abundance of shellfish and other collectible foods, became sedentary dwellers in large villages. These ancient Indians did not have pottery or agriculture.

The ancient hunting cultures or civilizations were followed by Indians who were farmers and manufacturers of pottery. Some of these Indians built burial mounds. This mound-building stage represented a cultural climax or florescence. It was a period of widespread trade and commerce and artistic achievements. From an artistic point of view, the remarkable Hopewell material from Ohio is a noteworthy example of this period. There are seven exhibits of Hopewell material in the main section of the new hall.

TEMPLES ON PYRAMIDS

In the next period of culture or civilization the Indians were intensive farmers who supplemented their agriculture with hunting, fishing, and gathering. Some groups of these Indians constructed large ceremonial centers consisting of earthen pyramids with flat summits upon which were erected wooden temples. These Indians made a variety of pottery, some of it for ceremonial use. The ceremonial pottery is rather impressive.

The main section of the new hall also has exhibits dealing with the first migrations of the Indians from Asia into America and exhibits illustrating the oldest cultures or civilizations of the New World. Also, it is in this section that the four model dioramas, previously mentioned, are to be found.

The third section concerns the various

KEY TO FIGURES

TOP OF PAGE, left to right: Natchez girl, Louisiana; Aztec warrior, Mexico; Pueblo girl, Arizona; Tehuelche man, Patagonia; Inca traveler, Andes; Macusi girl, Tropical Forest. BOTTOM OF PAGE: left, Fort Ancient harvest ceremony; right, Iroquois harvest ceremony. The figures shown are taken from exhibits in the Hall of Indian America. Those at the top are by Mrs. Alexander (Anne Harding) Spoehr; those at the bottom, by Staff Artist Gustaf Dalstrom.

INCA COMMUNITY IN A VALLEY OF THE ANDES

Before the Spanish conquest of Peru in A.D. 1532. A diorama in Indian America Hall.

techniques used by the archaeologist in learning how prehistoric Indians lived and in determining the time sequences and local culture growths that make up Indian history. The use of stylistic differences in delineating culture influences and areas, stratigraphy (or dating by superposition of buried remains), the kind of information contained in written records, and the determination of ancient trade routes are all explained. A life-size, partly excavated burial mound is shown to demonstrate how such structures are excavated. This section also includes exhibits on the techniques used by the Indians in making the objects dug up by the archaeologist. Of these, the way flint implements such as arrow points were produced should be of particular interest.

Exhibition as an art constantly grows, changes, and becomes more effective. The completion of the Hall of Indian America marks a step forward in the Museum's program of continuous improvement in its exhibits, so that knowledge of man and nature may be more widely diffused among the citizens of modern America.

BAYOU VILLAGE WITH TEMPLE MOUND IN LOUISIANA, A.D. 1300

A diorama in Indian America Hall.

Etruscan and Roman antiquities, dating from about the sixth century B.C., in stone, bronze, iron, pottery, and glass, and objects recovered from ancient Boscoreale and Pompeii, near Vesuvius, are exhibited in Edward E. and Emma B. Ayer Hall (Hall 2).

NATURE PHOTO EXHIBIT PLANS ANNOUNCED

The Nature Camera Club of Chicago and the Museum jointly announce the Fifth Chicago International Nature Photography Exhibition to be held at the Museum February 1 to 28, inclusive. To receive consideration, all entries must be received at the Museum not later than January 16. The names of judges will be announced later.

As in previous exhibitions, there will be two main divisions—prints and color transparencies. In each of these divisions there will be three classifications of pictures: *Animal Life*, *Plant Life*, and *General* (the last includes scenery, geological subjects, clouds, and other nature manifestations outside the two specific classifications). First-prize silver medals, ribbons, and other awards will be made in each classification of each division, it is announced by Mr. H. J. Johnson, chairman.

All persons interested in submitting entries are urged to communicate with the Museum or with Mrs. Louise Broman Janson, 6252 South Kedzie Avenue, Chicago 29, for entry forms and further information.

STAFF NOTES

Mr. Clifford H. Pope, Curator of Amphibians and Reptiles, has returned after spending the summer in continuance of his investigations of the habits and distribution of southern Appalachian salamanders. His work was conducted, as in several past years, at the headquarters of the Mountain Lake Biological Station at the University of Virginia. The present season resulted in the acquisition of much new material on woodland salamanders .... **Mr. George I. Quimby,** Curator of Exhibits, recently appeared on a quiz program of WMBQ television station. He displayed and explained some unusual Indian masks .... **Mr. Henry S. Dybas,** Assistant Curator of Insects, reports most successful collecting in Florida. The party, in the Museum's carry-all, reached Key West, where collections of the strand-fauna of beetles were made. On its return the party encountered the August hurricane, fortunately not at the center of its path .... **Mr. Bryan Patterson,** Curator of Fossil Mammals, recently attended a seminar on the fossil man-apes, Australopithecinae, of South Africa held in New York under the sponsorship of the Viking Fund .... **Dr. Sharat K. Roy,** Chief Curator of Geology, has returned from a six-week field trip in western and east-central New York state. During part of the trip he was accompanied by **Mr. Orville L. Gilpin,** Chief Preparator of Fossils. Collections made consist largely of invertebrate fossils of Middle and Lower Devonian formations—namely, Hamilton, Onondaga, and Oriskany.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

A complete series of Daemonelix, or "Devil's Corkscrew," secured by the Bad Lands Expedition of 1898, was installed in 1899. Also installed with the collection was a series illustrating the "phyllogeny" of *Daemonelix*, worked out by and received from Prof. E. H. Barbour, as well as photographs showing the mode of occurrence of the specimens. It is believed that these large structures were the burrows of extinct rodents. Their explanation was quite unknown in 1899.

Group of Daemonelix or "Devil's Corkscrew."

With regard to membership in the Museum, the Annual Report for 1899 reveals the following depressing account:

"There has been a further decrease in number of annual memberships, most by formal resignations, and for reasons in each case that seemed to justify the retirement. This may be expected in greater or less degree each year, so long as no effort is put forth even to hold the membership already obtained."

In marked contrast the Annual Report of 1948 reads:

"It is gratifying again to report an increase in number of Museum Members, since increase in membership indicates growing appreciation by the community of the scientific and educational work of Chicago Natural History Museum."

The total number of Members recorded in 1899, including all membership classifications, was 518. The number recorded for 1948 was 4,777.

Audubon Lecture Oct. 2

The Illinois Audubon Society will offer the first lecture of its new series in the James Simpson Theatre of Chicago Natural History Museum on Sunday afternoon, October 2, at 2:30 o'clock. Mr. Karl A. Maslowski, noted wild-life photographer, will present "Beneath Buckeye Skies." There is no charge for admission.

Herbarium from N. U.

A phanerogamic herbarium formerly belonging to Northwestern University is now in the Museum. This collection, consisting of some 15,000 specimens, contains valuable material from India and Europe as well as historically important species collected in the Chicago area and throughout the United States. The main collection contained in it is the Henry Babcock Herbarium. The entire cryptogamic herbarium of Northwestern University also was incorporated into the Herbarium of the Museum some years ago.

Technical Publications Issued

The following technical publications were issued by Chicago Natural History Museum recently:

Zoological Series, Vol. XIII, Part I, No. 4. *Catalogue of Birds of the Americas.* By Charles E. Hellmayr and Boardman Conover. Aug. 19, 1949. 358 pages.

Fieldiana: Zoology, Vol. 31, No. 32. *Notes on Some Veracruz Birds.* By Melvin A. Traylor, Jr. Aug. 19, 1949. 8 pages. $0.10.

Fieldiana: Zoology, Vol. 31, No. 33. *The Female External Genitalia of the Spotted Hyena.* By D. Dwight Davis and H. Elizabeth Story. Aug. 26, 1949. 8 pages, 2 text figures. $0.15.

Fieldiana: Geology, Vol. 10, No. 8. *Some Lower Huronian Stromatolites of Northern Michigan.* By Eugene S. Richardson, Jr. Aug. 26, 1949. 16 pages, 11 text figures. $0.30.

Geological Series, Vol. VII, No. 8. *The Navajo Meteorite.* By Sharat Kumar Roy and Robert Kriss Wyant. Aug. 30, 1949. 16 pages, 10 text figures. $0.30.

Fieldiana: Technique, No. 7. *Preserving Birds for Study.* By Emmet R. Blake. July 22, 1949. 38 pages, 18 text figures, and a cover design. $0.30.

OCTOBER LECTURE TOURS DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Oct. 5—Natural History Facts and Fallacies (*Lorain Farmer*).

Fri., Oct. 7—Primitive Music and Musicians. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Oct. 12—Color in Nature (*Jane Sharpe*).

Fri., Oct. 14—Autumn Trails. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Oct. 19—Party Givers and Goers—How People Entertain (*June Buchwald*).

Fri., Oct. 21—Bottled Sunshine—Fuels. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Oct. 26—Measuring and Record Keeping—Early and Primitive Instruments, Writing (*Harriet Smith*).

Fri., Oct. 28—Masks—Not for Halloween. Illustrated introduction in Meeting Room (*June Buchwald*).

Persons wishing to participate should apply at North Entrance. Tours are free. By pre-arrangement, special tours are available to groups.

Stanley Field Hall, the great central hall of the Museum, contains exhibits of specimens selected for their rarity, beauty, or general interest to represent the Museum's four scientific departments.

GIFTS TO THE MUSEUM DURING THE LAST MONTH

Department of Botany:

From: School of Forestry, Yale University, New Haven, Conn.—63 herbarium specimens, Venezuela and Panama; Dr. Fred A. Barkley, Medellín, Colombia—83 specimens of algae, Colombia; John L. Blum, Buffalo, N.Y.—98 specimens of algae, New York; Dr. A. B. Cribb, Brisbane, Australia—51 specimens of algae, Queensland, Australia; Dr. M. A. Brannon, Gainesville, Fla.—70 specimens of algae, Florida; Dr. Jacques Rousseau, Montreal, Canada—72 specimens of algae, northern Ungava.

Department of Geology:

From: Arthur H. Lees, Socorro, N.M.—3 invertebrate fossils, New Mexico; Alfred A. Look, Grand Junction, Colo.—*Ceratosuchus* fragments, Colorado; George Langford, Chicago—a collection of fossil fishes, turtles, and mammals, South Dakota.

Department of Zoology:

From: Chicago Zoological Society, Brookfield, Ill.—2 mammals; Lincoln Park Zoo, Chicago—3 mammals; Col. Clifford C. Gregg, Valparaiso, Ind.—a mole, Indiana; Dr. S. C. Bishop, Rochester, N.Y.—2 salamanders, Alabama; Misses Ruth and Ellen Carlson, West Chicago, Ill.—2 Manx cats; William Mangaras, Chicago—a mounted skull of alligator snapping turtle; Richard M. Straw, Minneapolis, Minn.—a snake, Maryland; Miss Fanny Lee, Vero Beach, Fla.—2 kinds of marine slugs, Florida.

Library:

From: Harvard Yenching Institute, Cambridge, Mass.; Dr. G. W. Hewes, Los Angeles; Mayuyama and Co., Tokyo, Japan; Dr. D. T. Stephanides, London; England; Karl P. Schmidt, Homewood, Ill.; and William J. Gerhard, Chicago.

ROSETTE TREES, A TROPICAL GROWTH FORM THAT DEFIES MOUNTAIN CLIMATE

By JOSÉ CUATRECASAS
CURATOR OF COLOMBIAN BOTANY

EVEN the most casual visitor to South America or other tropical areas gazes in amazement at the luxurious vegetation, for he gets here his first look at such striking and unfamiliar growth forms as giant herbs with enormous leaves, long and strong lianes, orchids growing high up in trees, big trees with prominent buttresses, and others equally distinct. His attention is especially drawn to the great number and variety of palms, tree ferns, and other plants that bear all their leaves at the top of the stem. Is it a mere coincidence that these plants are found only in the warmer regions of the world, those generally called tropical or subtropical, or is it possible to explain this distribution pattern?

In common usage the word "tropical" is often applied to indicate high annual temperatures, while "subtropical" and "extratropical" are applied to more moderate ones within or near the tropics. Actually such a restricted meaning is misleading and requires correction, at least in biology, because the tropical zone extends between the tropics of Cancer and Capricorn and, geographically speaking, everything within its limits is "tropical."

As is well known, all environmental factors affecting living beings on the earth vary in quality, intensity, direction, and periodicity from the poles to the equator. While some of these phenomena and their variations have been carefully measured and registered, others are completely unknown, or their variations caused by certain geographical conditions are not fully understood.

Of the climatic factors, temperature and its geographic variation are well recorded. Yet the biologist is not so much interested in such average temperatures, for the tropical zone is not primarily characterized by high temperature maxima but rather by a slight annual fluctuation between maximum and minimum temperatures, in other words, relatively uniform temperatures throughout the year. For instance, in July or August, it is hotter in Chicago or Berlin than anywhere along the equator. Mountainous highlands near the equator are extremely cold during the whole year, but in January it is much colder in Chicago or Berlin. Thus, we cannot compare a permanently cold place in tropical mountains with a region of the climatological characteristics of Illinois or central Europe. The climate of the tropical belt is unmistakably characterized by the uniformity of temperature throughout the year, high as well as low, but is well marked by a great daily variation of a rigorously periodic and regular character. The daily temperature variation at great altitudes runs parallel to the annual changes.

EFFECTS OF LIGHT

Light is another physical factor, which, in the tropics, is similar in its effects to those induced by high temperatures. The high incidence of light rays throughout the year is very characteristic of the tropics, as are the intensity, direction, and annual regularity of solar radiation.

Throughout the world, tropical vegetation, too, is markedly different from extratropical vegetation. The forests of warm tropical lands differ materially from those of low extratropical countries, as do the forests of tropical and extratropical mountains or the thickets and meadows of tropical peaks and the meadows of high extratropical mountains. For these reasons, the word "alpine" cannot be used for altitudinal belts in the tropics because vegetation and climate in the Alps (extratropical) also differ widely from the climate and vegetation in the Andes (tropical). The differences between the vegetation of the Alps and Andes are based not only on differences in floristic composition but on structural characteristics (growth forms), on the numerical representation of the latter and their effects on the appearance of plant communities and landscapes, and, with few exceptions, on the vitality of the species represented in these extreme habitats.

TYPICAL ROSETTE TREES
Stand of a palm, Schellea hutiracea, in Valle del Cauca, Colombia. Photograph by Dr. José Cuatrecasas.

Tropical plants exhibit certain structural traits that, even if they are not limited to them, are so well developed as to indicate their origin in the tropics. However, life forms (or growth forms) of tropical origin can be so widely distributed that some representatives are found outside the tropics.

FORMS OF TROPICAL ORIGIN

One such growth form suspected to have had a tropical origin despite the different temperatures prevailing in its present habitat is characterized by an unbranched, tall stem (or very scarcely branched), which is overtopped by a bunch of large leaves. Despite the fact that the plants belonging to this growth form are not real trees, they have been called "rosette trees." This growth form is most numerously represented by the palms, an eminently tropical group with hundreds of species and millions of individuals found in great numbers in the warm, temperate, and even cold tropical forests. Another group belonging to this growth form are the cycads (Cycadaceae), gymnosperms of great geological age.

Similarly, tree ferns are most characteristic of tropical forests of all altitudes, as are several Monocotyledons, some of which, because of their adaptations to more arid climates, are widely distributed even in subtropical countries (century plant, Joshua tree, and others). Even highly evolved families, such as the daisy family (Compositae), include members belonging to this growth form (especially *Senecio* in Africa, *Espeletia* in America, and *Argyroxiphium* in Asia). The same can be said of the Lobelia family (Lobeliaceae, *Lobelia* in Africa) and the Madder family (Rubiaceae, *Pentagonia* in America).

The presence of palms in the cold Andean belts might be explained as a progressive adaptation to a cooler climate. Actually, the tropical factor demonstrates that this adaptation is very effective, for we can find many palms at high levels in the Andean mountains. Yet this adaptation cannot be found outside of the tropics. Two of the cases mentioned, *Compositae* and *Lobeliaceae*, definitely prove the influence of the tropical factor, in that *Senecio* and *Espeletia* are limited to cold regions.

WIDE DISTRIBUTION

It is, therefore, evident that this growth form is of tropical origin and widely distributed in the tropics. It includes members

of very different groups ranging from the ferns and cycads to flowering plants. It is undoubtedly one of the oldest growth forms, which originated in tropical countries. Here the same influences persist today and assure its continuation as well as its appearance in other groups. In addition to the groups mentioned above, several others show a tendency to display this growth form in that their juvenile forms develop simple stems topped by crowns of large leaves. This condition may also prove that it is a primitive structural type. The following examples may be cited in this connection: several Rubiaceae, Lecythidaceae (*Grias*), Simarubaceae (*Simaba* sp.), Sterculiaceae and *Pouruma*, the adult form of which is a bracket tree.

Only experimental work can determine the real causes bringing about straight growth of the stem below the dense crown of terminal leaves. But the possibility exists that the tropics provide the special physical or physio-chemical factors and conditions prerequisite for the appearance of new forms. Understanding of the structure of plants, more than their systematic affinities, often aids in the interpretation of past climates and geographical conditions affecting fossil plants.

ROSETTE TREES IN PROFUSION

Dense forest in Indian Reservation of Tacueyó, Central Andes of Colombia. Wax palm and quinine trees grow here at an elevation of 11,000 feet in a cold-temperate climate. Photograph by Dr. José Cuatrecasas.

(*Herrania*, some *Theobroma* species), Flacourtiaceae, Euphorbiaceae (*Codiaeum*), Araliaceae, some Andean *Senecios*, several Guttiferae, Ochnaceae (*Cespedesia*), *Cecropia*,

PLEASE NOTIFY MUSEUM IF YOU'RE MOVING

Members of the Museum who change residence are urged to notify the Museum so that the BULLETIN and other communications may reach them promptly.

Members going away for extended periods may have Museum matter sent to their temporary addresses.

Ancient Peoples

Ancient peoples to whom exhibition halls are devoted in the Museum's Department of Anthropology include: the Etruscans and Romans (Edward E. and Emma B. Ayer Hall—Hall 2); ancient Southwest American Indians (Hall 7); the Mayas, Aztecs, Toltecs, and Zapotecs (Hall 8); ancient peoples of Peru, Colombia, and Chile (Hall 9); ancient Chinese (George T. and Frances Gaylord Smith Hall—Hall 24); New World peoples before Columbus (Hall 4); Stone Age peoples (Hall C); Egyptians (Hall J); and Babylonians (Hall K).

Culture pearls and natural Oriental pearls are displayed side by side for comparison among the exhibits of gems and jewels in H. N. Higinbotham Hall (Hall 31).

CAMERA FANS WELCOME; HERE'S HELPFUL DATA

Visitors to Chicago Natural History Museum are welcome to photograph any exhibit with the exception of those in Chauncey Keep Memorial Hall (Hall 3—Races of Mankind sculptures) and the groups containing restorations of prehistoric men in the Hall of the Stone Age (Hall C). These are copyrighted materials.

Hand cameras may be used without special permission, but the approval of the Director of the Museum must be obtained to use tripods, flashlights, or other photographic apparatus. Permits may be obtained in the office of the telephone operator to the west of the Main (North) Entrance. As Museum offices are closed all day Saturday and Sunday it is necessary for one who desires to take photographs on those days to arrange for permission by writing or calling in advance at the Museum. Permits thus issued will be held at the North Door counter for the persons to whom they are issued.

Museum attendance is greatest on Saturday and Sunday afternoons; therefore more freedom from interruption for the photographer and less disturbance of visitor traffic will occur if photographic work is restricted to morning hours.

For those interested in color photography, it is of value to know that Museum exhibits are lighted by 4,500° K. fluorescent tubes, but the level of illumination is low, requiring long exposures. The cases in some halls are not individually lighted. These receive only general illumination from incandescent tungsten bulbs in ceiling fixtures. The plate glass enclosing exhibits is not all the same color, and troublesome reflections are common. In photographing habitat groups, backgrounds, especially at the horizon line, tend to burn out before detail is registered in foreground shadows. Supplementary lighting is desirable, therefore, from flashlight or other portable, self-contained equipment, so placed as to avoid flare from the case glass into the camera lens. The Museum does not provide current for the use of floodlights.

Photographers may not restrict or in any way interfere with the movements of officially conducted tours of the exhibition halls for the general public or school groups.

CLIFFORD C. GREGG
Director

The ancient original culture of China, before the intrusion of Buddhism, and the culture of Buddhistic China, as influenced and modified by religious and artistic currents coming from India from the third century onward, are illustrated by the exhibits in George T. and Frances Gaylord Smith Hall (Hall 24).

SATURDAY AFTERNOON LECTURES AND COLOR FILMS TO BEGIN ON OCTOBER 1

Nine free illustrated lectures on travel and science will be given in the Museum's annual Autumn Course for adults on Saturday afternoons during October and November. The lectures will be presented in the James Simpson Theatre of the Museum at 2:30 P.M. All of the lectures will be illustrated with motion pictures in color.

Limited accommodations make it necessary to restrict the lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lecturers:

October 1—This Land of Ours

Edward F. Cross

Mr. Cross presents in color films the scenic and natural-history highlights of Arizona, Utah, and California. Spectacular views of the wonders of mountain and desert areas, many off the beaten path, are included. The film shows vegetation, birds, animals, and monuments as well as the life of various Indian tribes.

October 8—Guatemala

Roy A. Whipple

Mr. Whipple, noted world traveler, lecturer, sportsman, and photographer, has obtained fascinating motion pictures in color of Guatemala's scenic and archaeological features, the life of its people, and its flora and fauna.

October 15—North to the Yukon

Clereland P. Grant

Mr. Grant, who has appeared in many lectures at this Museum (where he was formerly a member of the staff), says of his present color films: "Here are the most gorgeous scenery, the most sympathetic studies of Indians, and the most thrilling shots of grizzlies I have ever photographed." His films cover the trip to the Yukon country through "Paul Bunyan land," the Indian reservations of the West, and the American and Canadian Rockies over the famous Alcan military highway. The audience then travels with him by boat and by foot into remote regions of Alaska. There is a trip with an Indian pack outfit to the lairs of grizzly bears, where remarkable pictures were obtained.

October 22—Explorations in Yucatan

Robert T. Hatt

Mr. Hatt's film is a record of archaeological field work and zoological collecting in Yucatan and remote Quintana Roo during an expedition of 1947. The film starts with views of Mexico City and the UNESCO meeting, followed by a flight over volcanoes, mountains, swamps, and sea to Veracruz and Tabasco. A brief visit is made to Campeche, the colorful old walled city of pirate fame. Merida, the capital of Yucatan, is shown. The rest of the film records the expedition's "digs" in caves, the material recovered, and experiences while collecting animals in the Yucatan scrub and in the high chicle forest of Quintana Roo.

October 29—Garden of Glaciers

Maynard Miller

Mr. Miller is a veteran of five expeditions into the almost inaccessible mountain regions of coastal Alaska, one of the largest glacial areas on the globe. In 1946, by foot and by small boat, he explored the fiords of southeastern Alaska, where great glaciers discharge their bergs into the sea. In 1947 he flew thousands of miles over terrain seldom seen by man—the mountains and gorges where these glaciers are born.

RESERVED SEATS FOR MEMBERS

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

November 5—Camera Trails

Dick Bird

Mr. Bird, noted Canadian naturalist and photographer, brings films presenting a colorful and spectacular panorama of nature. The pictures are a dramatic avian review, from poker-faced owls to tiny, energetic chickadees, from the strange comedy of white pelicans to the astonishing nuptial antics of the western grebe. The family lives of bluebirds, warblers, wrens, grebes, avocets, ducks, and shore birds are shown. There are also patterns of dew-drenched spider webs, pictures of colorful insects, and studies of mammals.

November 12—The Forbidden Jungle

Per Host

Mr. Host's film is the first made of the little-known and unexplored jungle of Darien, which lies on the border of Panama and Colombia. Out of this "lost world" Mr. Host brings the story of the "White Indians" and strange jungle animals. You will witness the witch doctor perform his weird secret rites against "evil spirits" in a land where women rule. You will travel by dugout canoe up jungle rivers through unexplored territory and you will see howling monkeys, bright-colored toucans, deadly bushmaster snakes, and rare jungle flowers. The film also includes major sequences of the colorful Indians on the San Blas Islands.

November 19—Flame in the Jungle

Peter Koch

The subjects of Mr. Koch's lecture and color films are the almost unknown Djuka tribes of Dutch Guiana that are among the world's most interesting primitive peoples. Mr. Koch takes his audience on 600 miles of adventurous travel in dugout canoes to reach the hidden interior kingdom of the Djukas on the upper Surinam River. He shows the palm-thatched huts and villages of these people in the remote South American jungles, their masterpieces of symbolic pagan art, and strange voodoo rituals.

November 26—Oil Round the World

Telford H. Work, M.D.

"Oil Round the World" required a year and 62,000 miles of sea-voyaging to film. It is the story of Dr. Work's travels aboard an oil tanker carrying petroleum from the oil-rich to the oil-scarce areas of the world. He captured on color film the story of the ship's precious cargo—oil—on its journey across the Pacific to the Far East, the Middle East, North Africa, the West Indies, and back home to the United States. He shows scenes of Japan, Singapore, Ceylon, and Saudi Arabia, newest field of American pioneering in the petroleum industry.

NEW MEMBERS

The following persons became Museum Members between August 16 and September 9:

Associate Members

Edgar E. Maehler

Sustaining Members

Dr. Edward C. Holmblad, John W. Pope, J. P. Seeburg II, J. P. Smith.

Annual Members

Foster G. Beamsley, Joseph C. Beaven, Mrs. George A. Becker, Edward E. Carstens, Clifford F. Estey, Dr. Michael S. Farmans, Miss Helen M. Ganey, Dr. H. Wallace Greig, Miss Eliza P. Hall, R. Neison Harris, Joseph C. Kay, Mrs. Walter D. Larkin, Adolf Marx, H. T. McDermott, Miss Malinda Moench, Harold M. B. Ressler, William Edouard Scott, Frank J. Sloup, Albert G. Wade II, Robert M. Wales.

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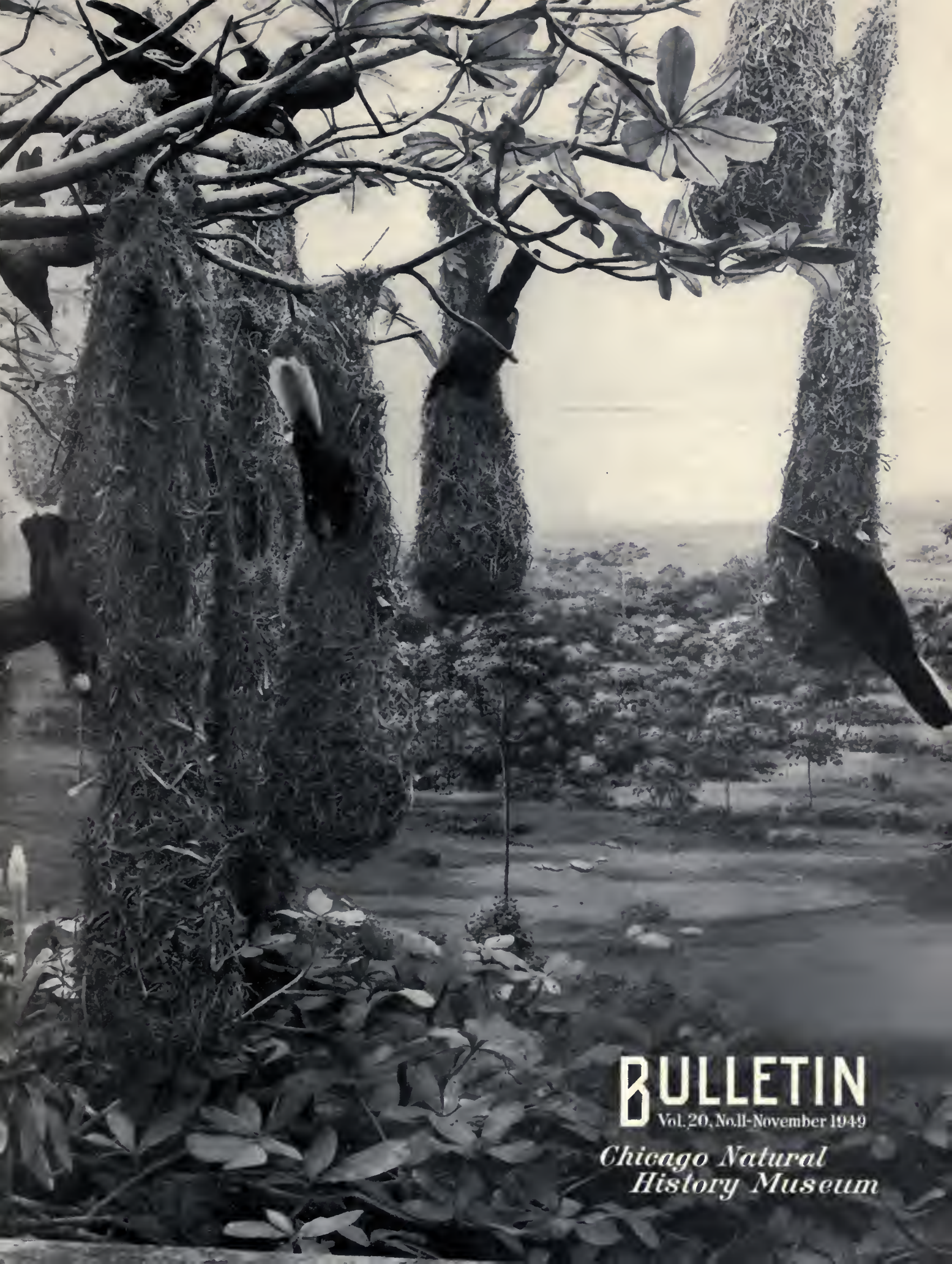

BULLETIN

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Chicago Natural History Museum

Chicago Natural History Museum

FOUNDED BY MARSHALL FIELD, 1893

Roosevelt Road and Lake Shore Drive, Chicago 5

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Members are requested to inform the Museum promptly of changes of address.

November Special Exhibit . . .

ORCHIDS OF THE WORLD IN WATER COLORS

A special exhibit of 50 water color paintings representing as many kinds of orchids from all over the world will be held during the entire month of November in Stanley Field Hall of the Museum. The paintings are by Mr. H. Gilbert Foote, a Chicago artist well known for his specialization in this field. Mr. Foote became interested in painting orchids after studying 15,000 plants of this family in the greenhouse of his father, Mr. A. L. Foote in Oklahoma City. Later he studied hundreds of beautiful orchids growing in the Garfield Park and Lincoln Park Conservatories of the Chicago Park System.

Mr. Foote chose the medium of water colors for painting these flowers because, he says, "it permits greater color fidelity and accurate delineation of fine detail." The style of painting is that of the 18th Century botanical artists, with the names of the plants shown in Spencerian script. All paintings in the exhibit were made directly from living plants in the two Chicago conservatories and in the greenhouse of Mr. Foote in Oklahoma City. The species represented are all natives of distant lands—India, China, South America, Africa and elsewhere.

The exhibit is a unique combination of art with horticulture. The paintings are in life size. Through the co-operation of Mr. William C. Blaesing, Chief Horticulturist of the Chicago Park District, and Mr. Merton C. Logsdon, Floriculturist of the Lincoln Park Conservatory, the exhibit will include a series of living plants showing different stages of growth of an orchid over a period of eight years, starting with germinating seeds and ending with a plant bearing mature fruits. These specimens are accompanied by botanical charts showing hybridization, the structure of the orchid plant, and photographs illustrating their main habitats.

Mr. Foote, whose professional work is now in the field of commercial art and art buying for a large Chicago corporation, formerly taught landscape painting at the Art Institute of Chicago and the Chicago Academy of Fine Arts. His work has been exhibited at the Art Institute, the Chicago Galleries Association, and the Los Angeles Museum. His home is in Glen Ellyn, Illinois.

A MADAGASCAR ORCHID

One of the Gilbert Foote water colors to be exhibited during November. The species represented is Angraecum Sesquipedale.

ANTHROPOLOGY PROJECT IN THE MARIANAS

Dr. Alexander Spoehr, Curator of Oceanic Ethnology, left October 17 for a year's anthropological research for Chicago Natural History Museum on Saipan, Marianas Islands, United States Trust Territory of the Pacific.

Dr. Spoehr will make a detailed study of culture change among the Chamorros, as the native peoples are called, of Saipan and the neighboring islands, with particular reference to the re-forming of community life since the disruption of the war. During the latter part of his stay, Dr. Spoehr will also conduct archaeological excavations in the Marianas to determine how this corner of the Pacific was originally peopled.

The Museum expedition to Saipan is sponsored by the National Research Council, Washington D.C. and will be conducted in co-operation with the Navy Department.

THIS MONTH'S COVER

A nesting colony of the giant oriole called Montezuma Oropendola is one of the most arresting sights in the bird world. The picture on our cover shows such a colony as reproduced in an exhibit in Hall 20 (bird habitats). It is based on an actual colony found in eastern Guatemala that contained 138 nests in the top of a tree towering more than 100 feet. The immense nests are the work of the females. The males act as sentinels to warn the workers of danger. (See NESTS, pages 3–4.)

FREE CHILDREN'S MOVIES ON SATURDAY MORNINGS

The Autumn Series of free motion-picture programs for children on Saturday mornings, presented by the James Nelson and Anna Louise Raymond Foundation, will continue through November 26. All of these programs will be given at 10:30 A.M. in the James Simpson Theatre of the Museum. In addition to motion pictures, lecturers will appear on two of the remaining four programs.

Children may come alone, accompanied by adults, or in groups from schools, etc. No tickets are needed.

November 5—CHILDREN OF THE NEW WORLD
Americans all

November 12—SUWANNEE ADVENTURE
Story of the Suwannee River
Talk by Allan Cruickshank

November 19—ALONG SMOKY MOUNTAIN TRAILS
A cycle of the seasons
Talk by Peter Koch

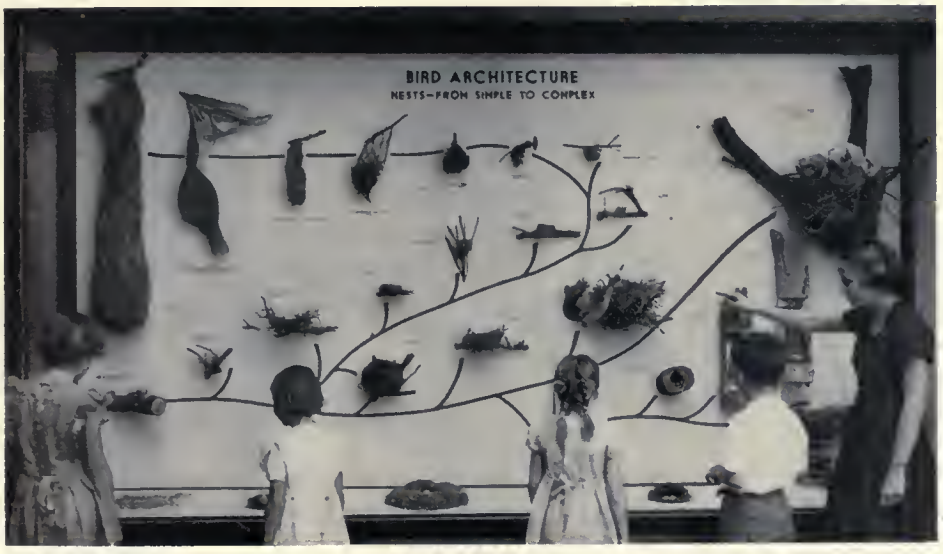
November 26—SOUTH AMERICAN HIGHLANDERS
Also a cartoon

More than a thousand examples of carved jade, arranged in chronological order, from the early archaic period (about 1500 B.C.) down to the end of the nineteenth century, are on display in Hall 30.

EVOLUTION OF BIRDS' NESTS TRACED IN A NEW EXHIBIT

By AUSTIN L. RAND
CURATOR OF BIRDS

TO PUT them in their proper perspective in the animal kingdom, birds' nests are cradles for the eggs and, in many cases, nurseries for the young. They are comparable to the nest of leaves a squirrel makes in a tree top, the stone nest of a bass in a lake, and the elaborate nests of ants and wasps. The basic plan for a nest, as one would expect, is a saucer- or cup-shaped hollow or structure, but the variations on this theme are great, from a depression scratched in the ground to a cup of fiber slung in a globular covering in the top of a tree where it forms part of a community structure.



BIRD ARCHITECTURE

Miss Jane Sharpe, of the Raymond Foundation staff, points out to a group of young Museum visitors the new bird's-nest exhibit in Hall 21. Nests arranged in series from simple to complex show stages in nest building.

As birds evolved from reptiles, a point on which we have fossil evidence, so did the elaborate nest-building of birds evolve from simple kinds, and simple nest-building from such early beginnings as the reptile's habit of burying its eggs in the earth, though on this point we have no fossil evidence. When birds became warm-blooded and the eggs needed incubation, nests became necessary, and the warm-blooded condition and nest building probably developed together. And as birds occupied many habitats—the water, the ground, the trees, and the air—their nests, from species to species, became distributed through as many different sorts of places as was practical.

SITES AND TYPES VARY

Some birds exhibit great variation in their choice of a nest site and in the type of nest built, but most kinds of birds build a particular type of nest, in a typical way and in a typical place. So true is this that keys to the identification of birds' nests in the eastern United States have been successfully made and used.

From species to species the nesting habits of present-day birds vary from the simple, approximating the reptile condition, to the very complex. In most cases it is possible to find connecting or intermediate types to form a series, which resembles the series of stages through which one would have expected birds' nests to evolve. It is this aspect of birds' nests that is shown, in part, in a new exhibit in the Bird Hall (Hall 21). Here we are dealing not with a structure but with the concrete product of a pattern of behavior.

We shall now take these up in the order of simple to complex.

EGGS LAID IN OR ON THE GROUND

1. *Buried in the ground:* The mound builders of the Malaya-Australian area, which are relatives of the domestic fowl, bury their eggs in the ground or in a mound of surface litter they scrape up in the forest (whence their name). There they leave their eggs to incubate by the heat of the soil, sometimes due to vulcanism, sometimes due to the rotting of the vegetable matter in the soil. The young are so well developed at hatching that they get along without a parent's care. Scarcely less extraordinary for a bird is the manner in which the Egyptian plover or courser, perhaps better known as the crocodile bird, buries its eggs in the sand, leaving no trace of where they are buried, and then squats on top of the sand above the site of the buried eggs. During the day, at least, the sand may be burning hot, and it has been suggested that the bird sits on top of the sand covering the eggs to shade them and keep them cool.

Though here we have what seems close to the postulated original reptile-like method of nidification, it has cropped up in two quite distantly related birds, and we can't help thinking that it is a reversal to an earlier condition rather than a truly primitive one.

2. *No nest, or a rude nest:* Nighthawks of the United States and coursers of Africa are among the birds that lay their eggs directly on the ground without any preparation; murres and auks do the same on rocky ledges. It is but a step from this to the scanty hollows scratched out by many terns or shore birds and in which a few bits of shell, stones, or scraps of vegetation are added. Terns are often influenced by local conditions. If material is plentiful they may make quite a bulky nest, while if it is scarce they may be content with little more than a scraped-out hollow. Many birds, including pheasants, grouse, gulls, and loons, make only a crude nest on the ground. Some that may make their nests on the ground in one locality may in another make them in trees, like herring gulls and cormorants. Some other species that are ordinarily tree-nesting, like the robin, mourning dove, and osprey, may occasionally nest on the ground. It would seem that in addition to being a step on the way to a well-constructed ground nest, the rude ground nest also fits into the early part of the tree-nesting series.

Several modifications of nests seem to have reached their maximum development in this group: the nest with a blanket of eiderdown provided by the material plucked from the bird's own breast and the truncate cone of mud, with a hollow in the top for the eggs, made by flamingoes. The habit of birds that make burrows in the earth for their eggs but provide little or no nest material for the eggs to rest on during incubation, such as some petrels, kingfishers, penguins, burrowing owls, motmots, and bee eaters, might be considered an offshoot of this primitive ground nesting, though undoubtedly it arose independently many times.

3. *Advanced ground nests:* The well-made cup nest set into a hollow scratched in the ground and with walls raised more or less

GROUND NESTS

The meadow lark makes a domed nest (left) on the ground and the bobolink an open cup (right).

above ground level is a common type with song birds, such as larks and vesper sparrows. A specialization in this type that seems to be an end product, perhaps an ancestral trait retained, is that of larks sometimes placing pebbles as paving stones in front of their nests. The domed nest of the meadow lark and the oven-bird warbler are logical outcomes of providing protection over the nest in the form of a roof. Other species, such as the junco and the Townsend solitaire, may get protection from above by sometimes placing their nests under projecting banks, and from this it is but a step to the rough-winged swallow that may nest deep in some ready-made burrow.

As we have mentioned earlier, birds that ordinarily nest in trees may sometimes nest on the ground, like the robin, and the low-nesting song sparrow may build its cup-shaped nest either on the ground or in a

CUP NEST

All the members of the family Vireonidae (vireos) make a similar nest—a neat cup slung by its edges.

bush. It is probable there has been considerable exchange from tree to ground nesting by birds, as there still is.

TREE NESTS

4. *Simple nests:* The classical example of simple nest is that of the fairy tern, which may lay its single egg on the naked branch of a tree, depending on irregularities in the bark to hold the egg safe. But the few crossed twigs of fruit-pigeons' nests, the scant platform of twigs of a frogmouth, and the doves' nests on palm leaves or the shelves of ferns growing from the sides of trees are little advances in nest building. Many heron and ibis nests are little but flattened bundles of sticks, and the nest of the yellow-billed cuckoo is the same.

The typical cup we find in many song birds: the robin, grackle, and cardinal. In these we find differentiation of material, coarse material forming the shell of the nest and finer material the lining. In one direction this reaches its peak in the big stick-nests of hawks, eagles, and crows and is carried beyond to the domed stick-nest of the magpie. In another direction we have the neat structures of fine material, like those of some warblers, the goldfinch, hummingbird, and wood peewee, some of which may have the outside bound together with animal silk. These form a progression toward the slung cup of the vireo, the semi-pensile nest of the kinglet, and the deep purse of the cassiques and oropendolas that are hung by having the rim about the entrance wrapped around the supporting twigs.

The next step is the globular nest or a retort-shaped nest with an entrance in the side, which is hung from a special strand that allows it to swing free. Though the nests of weaver birds and sunbirds are thus placed near the top of the pendant series, they also recall the domed nest of the marsh wren supported by reeds on all sides and the retort-shaped nests of some weaver birds that are placed among branches. The sociable weaver bird carries the theme of a pendant nest still further—the colony constructs a big roof in a tree top and all the birds in the colony make their retort-shaped nests under it.

We have not mentioned yet the arboreal birds that make their nests in any cranny or crevice, like the house wren, or that customarily nest in a hollow in a tree, like the barred owl, the mountain bluebird, and the tree swallow. The woodpeckers and some parrots and trogons stand apart as birds that chisel or chew their own tunnels into solid wood and lay their eggs on the bare wood or the scattered chips left there. They are the arboreal counterparts of the subterranean burrowers, the kingfishers, petrels, and burrowing owl.

We have sketched some of the outstanding types of variation in nesting, some of which are illustrated in the new exhibit. These have been arranged into series showing "relationship" in construction, form, and placement. These series probably do illustrate actual stages through which birds' nests evolved, but the series very definitely do not show blood relationships. The petrels, the kingfishers, the bank swallows, and the owls, which all burrow, have little else in common. Rather than blood relationships these series perhaps indicate how adaptable are birds and how they have changed their nesting habits to utilize the many ecological niches that were available.

This exhibit far from exhausts the subject of nests. When gathering together material on this exhibit, a list of headings was drawn up. The list included such entries as multiple nests, communal nests, symbiotic nesting, social parasitism, cock nests, uses of nests, nests placed near other animals, spacing of nests, nest construction, size of nest versus size of bird, nest sites, nest materials, unusual nests, and changes brought about by civilization. Some of these items will be taken up in a companion screen to be placed on the other side of Hall 21.

VARIETY OF NESTS IN FAMILY

Members of the family Icteridae (blackbirds, grackels, orioles, etc.) make a wide variety of nests depending on the species. Those shown above are (left to right): a cup in vegetation (red-winged blackbird), a pensile purse-shaped nest in tree (Baltimore oriole), and a very deep pensile purse in tree (oropendola). See accompanying sketch for nests of meadow lark and bobolink.

ANOTHER AUDUBON LECTURE

The second lecture in the series being presented at the Museum by the Illinois Audubon Society will be "Alluring Alaska," by Father George M. Link on Monday evening, November 28 at 8. It will be given in the James Simpson Theatre of the Museum, and doors will be opened at 7:30. This is a timely film program featuring wildlife of the Alaska wilderness—including unusual sequences of wolves, bear and deer among majestic mountains, wilderness forests and flower-filled meadows, all in full color.

Visiting Hours Change

Museum hours, which have been 9 A.M. to 5 P.M. in the autumn, change to the winter schedule—9 A.M. to 4 P.M., November 1 to February 28.

NATURE PHOTO ENTRIES

Perhaps some of the outdoor pictures you made on your vacation might qualify—

The Nature Camera Club of Chicago and the Museum are ready to receive entries for the Fifth Chicago International Nature Photography Exhibition to be held at the Museum; deadline is January 16.

There will be two main divisions—prints and color transparencies. In each there will be three classifications: *Animal Life*, *Plant Life*, and *General* (the last includes scenery, and nature manifestations outside the specific classifications). Awards will be made in each classification.

All persons interested in submitting entries are urged to communicate with the Museum or with Mrs. Louise Broman Janson, 6252 South Kedzie Avenue, Chicago 29, for entry forms.

SATURDAY LECTURES THROUGH NOVEMBER

Four more lectures remain to be given in November in the autumn course for adults on Saturday afternoons. These lectures on travel and science are illustrated with color motion pictures. All begin at 2:30 P.M. in the James Simpson Theatre of the Museum.

Limited accommodations make it necessary to restrict the lectures to adults. Members of the Museum are entitled to reserved seats on application. For children, free motion pictures will be presented on the mornings of the same Saturdays by the Raymond Foundation.

Following are the dates, subjects, and lectures:

November 5—CAMERA TRAILS
Dick Bird

November 12—THE FORBIDDEN JUNGLE
Per Host

November 19—FLAME IN THE JUNGLE
Peter Koch

November 26—OIL ROUND THE WORLD
Telford H. Work, M.D.

No tickets are necessary for admission to these lectures. A section of the Theatre is reserved for Members of the Museum, each of whom is entitled to two reserved seats. Requests for these seats should be made in advance by telephone (WAbash 2-9410) or in writing, and seats will be held in the Member's name until 2:30 o'clock on the lecture day.

EXCAVATION OF A MASTODON ON AN INDIANA FARM

Ever since the Museum first opened its doors, a mounted skeleton of the American Mastodon has been a feature of its halls of paleontology. For an equal length of time the staff of the Department of Geology has been dissatisfied with the skeleton, which is complete but not too well preserved. To replace it by a good, essentially complete specimen has been a hope long deferred.

Mastodons are comparatively common as fossils go, and remains of them continually turn up in the formerly glaciated parts of the country, usually during ditching operations aimed at lowering the water table in former swamps. Reports of such finds frequently come in to the Museum and any that seem promising are investigated. One such prospect is being worked as this BULLETIN goes to press.

Last April, Mr. Myron Benedict, a farmer residing near Valparaiso, Indiana, noticed a large bone protruding from the bank of a small drainage ditch on his farm. It turned out to be the humerus bone of a mastodon. A small amount of digging revealed a badly disintegrated tusk, the lower jaws, and a number of vertebrae. Mr. Benedict kindly notified the Director of the Museum and arrangements were made to excavate during the fall—the best time for such work.

Mr. Bryan Patterson, Curator of Fossil Mammals, and Mr. Orville L. Gilpin, Chief Preparator, enthusiastically aided by Mr. Benedict and his sons, have been working at this site since October 4. Many additional bones have been found. The skeleton appears to have been scattered somewhat before burial was complete, which necessitates a great deal of excavation. Fortunately the adjacent landowner, Mr. C. J. Spindler of Valparaiso, generously agreed to excavation on his land when the work showed such steps to be necessary.

The work will continue until no more bone is encountered. Should this prove to be the long hoped-for find that will yield a specimen sufficiently complete to mount, the BULLETIN will contain further news on the subject.

Photograph courtesy Chicago Sun-Times

PALEONTOLOGISTS DIG A SITE NEAR CHICAGO

Bryan Patterson (left), the Museum's Curator of Fossil Mammals, supervises excavation of mastodon that roamed vicinity of Valparaiso, Indiana, about 20,000 years ago. Next two from left, uncovering bones are Walter Benedict and Myron Benedict on whose farm the specimen was discovered; at right is Orville Gilpin, the Museum's Chief Preparator in Paleontology. At top, is Alan Patterson, son of the curator.

The Hall of Plant Life (Martin A. and Carrie Ryerson Hall—Hall 29) includes representatives of the whole vegetable kingdom from bacteria to orchids and daisies, grouped into plant families and arranged in systematic series.

With the exception of the hoofed mammals, Hall 15 contains members of the principal groups of mammals of the world, arranged according to their relationship.

EVIDENCE OF EARLY FIRE-PREVENTION EFFORTS FOUND IN A SOUTHWEST PUEBLO BY DR. MARTIN

About 1,000 years ago the Mogollon Indians of the Southwest decided to adopt the newest fashion in New World architecture (see September, 1949, BULLETIN, page 3). Neighboring tribes were giving up their old-fashioned pit houses, which were rather damp and cellar-like, for houses built on the surface of the ground.

The Mogollones followed suit and built a house of several rooms with a floor at ground level. But lacking experience, the Mogollones constructed their walls of pine poles, set stockade fashion, instead of building stone walls. In using pine poles the people had courted disaster; for what burns faster and hotter than a pine log full of pitch?

One day, in preparation for a feast, a large fire was kindled. A spark or two lodged in the pine walls and, before anyone could prevent it, the walls were aflame. The house was soon a mass of smoldering embers. The Indians decided to rebuild on the same spot, but this time the walls were constructed entirely of stone. In this way future fire hazards would be eliminated.

Thus do Dr. Paul S. Martin, Chief Curator of Anthropology, and his associates on the Southwest Archaeological Expedition, 1949, reconstruct the story of the site of their most recent excavations at Three Pines Knoll deep in a forest near Reserve, in western New Mexico.

EARLIEST AMERICAN 'FIRETRAP'

Three Pines Pueblo, showing remains of earlier, wooden house (rows of post holes) and stone walls put up later to prevent further fires. Observers are looking at remains of human skeleton brought forth from burial pit.

A stone-walled house was encountered, but lying partly within and partly without the stone walls were the remains of an earlier house, the walls of which had been of pine poles set stockade fashion. The poles were set in holes, each one measuring about 6 inches in diameter and 8 inches deep. The holes themselves were fairly close together. In some of these holes were found the charred stumps of the posts that once constituted walls.

In the floor of one room was a bell-shaped pit about two feet in diameter and two feet in depth. A skeleton of a young male was found in this pit—placed there and sealed over with a hard clay floor before the pole-house burned down. Near the dwelling were the remains of a subterranean structure—a pit house belonging to an earlier generation of Mogollon Indians that was used as a community dumping ground by the people who built and lived in the surface village of later times.

Further excavations are planned in the hope of shedding more light on these people who were on the point of making startling innovations in their old and, previously, very conservative culture. The beginnings of the culture of these Indians go back perhaps 10,000 years, and new features, consequently, were not too eagerly adopted by the Mogollones of A.D. 1000.

Books

Museum publications are available at the North Entrance of the Museum. Mail orders will be filled promptly if accompanied by remittance of 30 cents plus postage (in this instance 5 cents).

PRESERVING BIRDS FOR STUDY (Fieldiana—Technique No. 7). By Emmet R. Blake, Associate Curator of Birds. Chicago Natural History Museum, 1949. 38 pages, 18 illustrations. Price 30 cents.

There comes a time in everyone's life when he finds some interesting-looking bird—perhaps under a plate-glass window where it has incautiously dashed itself to death, perhaps on the highway where it has heedlessly flown into a motorcar, perhaps under the paws of the family tabby. How often the finder wishes he could save it and have it identified! The traveler in little-known tropical countries or the resident there may want to start studying birds. Suddenly he realizes that the first step is to save one individual at least of each kind of bird and send it to a museum for determination or to have the identification checked. And he wonders how to go about it.

Schools and boys' clubs have not the freedom of collecting birds for a school study-collection that they used to have, for general collections must be made under the auspices of the Fish and Wildlife Service in Washington. If the Service decides that the situation warrants it, a permit may be issued. But even without permits, some birds are unprotected by law. These include house sparrows, starlings, crows, and perhaps a few others, and sportsmen may contribute a few specimens from their bags taken in the hunting field to form the nucleus of a legitimate collection.

As to how to do it, the Museum has just published a pamphlet, *Preserving Birds for Study*, by Associate Curator of Birds Emmet R. Blake. With 18 pictures and 38 pages of text he sets forth briefly and clearly how one makes a bird skin. The process is the same, whether done in the museum, on your kitchen table, or in a tent high in the Andes of South America. The result, of course, depends on the individual's application and skill, and it's practice that enables one to make of the limp corpse of a bird a specimen that is worthy of permanent housing in the study collection. There it rests, a reference object, like a book in a library. The specialists, who can interpret such reference material, will some day use it, and from it perhaps will be taken data that, put into words, all can read.

AUSTIN L. RAND
Curator of Birds

EXPEDITION TO SIAM COMPLETES WORK

The Rush Watkins Zoological Expedition has completed its work in Asia.

Mr. A. Rush Watkins, well-known Chicagoan and sponsor of the expedition, and Mr. Colin Campbell Sanborn, Curator of Mammals, returned in October after five months' work in Siam and Europe. One of the principal objectives of the expedition was to obtain specimens of the boldly marked Malay tapir for a habitat group in the Hall of Asiatic Mammals (Hall 17) and this objective was successfully achieved. Two specimens of the tapir were collected after much travel in Siam and many hours of tramping through dense and very hot jungle. Valuable notes on the habits and life history of the tapir were secured.

In north central Siam, specimens of the rare Eld's deer were taken and Mr. James Gairdner of Bangkok presented the Museum with three very fine pairs of horns of this deer, the Siamese race of which, in the opinion of the local hunters, will be extinct in the next four or five years.

As most of the time had to be devoted to tapir and deer, only a small collection of squirrels, rats, monkeys, bats, and birds was obtained. Fresh-water fishes were taken in various places and a representative collection sent home. Few poisonous snakes were encountered, in fact only one small cobra was seen.

The collections made in Siam are expected to arrive in Chicago about the middle of November.

Mr. Sanborn spoke on the Museum and on the work of the expedition before the Siam Society, the Rotary Club of Bangkok, and the Assumption Business College. On the way home he spent about three weeks at the Raffles Museum in Singapore and at the British Museum (Natural History) in London, examining types and studying Siamese mammals.

All travel was by air and the members of the expedition flew around the world. Travel to one camp in Siam was by the Siamese Airways.

Officials of the Siamese government aided the work of the expedition in every way possible, facilitating customs procedure, providing the permits for firearms, and giving police protection in one politically disturbed area.

Technical Publications Issued

Fieldiana: Zoology, Vol. 31, No. 34. *The Shoulder Architecture of Bears and Other Carnivores.* By D. Dwight Davis. September 16, 1949, 22 pages, 8 text figures. $0.25.

Fieldiana: Zoology, Vol. 31, No. 35. *The Races of the African Wood-Dove, Turtur afer.* By Austin L. Rand. September 16, 1949. 6 pages. $0.10.

400 ATTEND OPENING OF 'INDIAN AMERICA' HALL

Approximately 400 Members of the Museum, and a number of special guests and representatives of the press attended the Museum's reception and tea for the formal opening of its newest hall, "Indian America" (Hall 4) on October 12, Columbus Day.

GUESTS AT TEA TABLE FOR 'INDIAN AMERICA' HALL OPENING

Mr. Stanley Field, President of the Museum, and Mrs. Field headed the reception line.

Among those acting as hosts and hostesses were Colonel Clifford C. Gregg, Director of the Museum, and Mrs. Gregg; Mr. John R. Millar, Deputy Director, and Mrs. Millar; Dr. Paul S. Martin, Chief Curator of Anthropology; Dr. Alexander Spoehr, Curator of Oceanic Ethnology; Mr. Donald Collier, Curator of South American Ethnology and Archaeology; Mr. George I. Quimby, Curator of Exhibits; Dr. Wilfrid D. Hambly, Curator of African Ethnology; Mr. Gustaf Dalstrom, staff artist; Mr. Alfred Lee Rowell, staff dioramist, and Miss Agnes H. McNary, secretary of the Department of Anthropology.

Pouring at the tea tables were Mrs. Donald Collier, Mrs. Wilfrid D. Hambly, Mrs. Gustaf Dalstrom, Mrs. Alfred Lee Rowell, Mrs. Wesley R. Buchwald, Miss Harriet Smith, and Mrs. Frederick S. Howell, Museum Librarian.

A description of the hall appeared in the October BULLETIN.

NOVEMBER LECTURE TOURS DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Wed., Nov. 2—Designs in Wood—Tree Growths That Result in Beautiful Patterns (*Miriam Wood*).

Fri., Nov. 4—Reptiles of Ancient and Modern Times. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Nov. 9—How Animals Spend the Winter (*Lorain Farmer*).

Fri., Nov. 11—South of the Border—1492 (Aztec, Maya, and Inca civilizations). Illustrated introduction in Meeting Room (*June Buchwald*).

Wed., Nov. 16—Poisonous Plants and Animals (*Marie Svoboda*).

Fri., Nov. 18—Jewelry—Precious and Costume. Illustrated introduction in Meeting Room (*Harriet Smith*).

Wed., Nov. 23—The Diversity of Living Things (*Jane Sharpe*).

Fri., Nov. 25—Activities Behind A Great Museum. Illustrated introduction in Meeting Room (*Lorain Farmer*).

Wed., Nov. 30—Out of this World—Meteorites (*Anne Stromquist*).

Persons wishing to participate should apply at North Entrance. Tours are free.

There will be no tour on Thursday, November 24, on account of the Thanksgiving Day holiday, but the Museum will be open to visitors as usual.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

The great changes in fifty years of Museum history in the exhibition halls are often extremely obvious. Examination of the Annual Reports of the Museum brings

An Oraibi Blue Flute Altar
(no longer on exhibition)

out equally important and sometimes even greater changes in the operations of various divisions, such as Photography and Printing.

In the report for 1899, for example, of the Division of Photography, the total negatives, prints and lantern slides made is 1,031, compared with the total production for the Division of Photography for the last year of record of 19,802 items.

NEW MEMBERS

The following persons became Museum Members between September 10 and October 14:

Associate Members

Merwyn E. Cedar, J. W. Lynch

Sustaining Members

G. A. Huggins, Miss Eugenie A. Mabson

Annual Members

Mrs. T. George Allen, Miss Olga C. Boyer, John W. Cameron, Charles Carqueville, Miss Blanche C. Cedarburg, Elbridge H. Condee, I. D. Cotterman, C. A. Crowley, S. J. Crowley, Charles S. Dunphy, Miss Elizabeth Hartung, R. J. Kennedy, Frank F. Kolbe, Hugo E. Magnuson, George F. Manzelmann, P. J. Marqua, Mrs. Leroy Martin, Cyrus R. Osborn, Fred Pacholke, Nelson C. Peck, Miss Maude Purdue, George H. Redding, Frank E. Reicin, Keith Rich, George Rose, Charles Rozmarek, Dr. A. H. Rudolph, James Shearer II, Mrs. Gertrude C. Tartak, Noah William Taussig, Miss Martha Thomas, Dr. Albert Vanderkloot, Dr. Clifford M. Wilk, Henry T. Williamson, Orrin E. Wolf.

STAFF NOTES

Mr. Eugene Richardson, Curator of Fossil Invertebrates, and **Mr. George Langford,** Assistant Curator of Fossil Plants, will make a field trip of about two weeks' duration this month to localities in Tennessee to collect fossil animals and plants of the Tertiary and Cretaceous periods. Much of the material to be collected will be used for exhibition in the new cases in Frederick J. V. Skiff Hall (Hall 37). Some of the Cretaceous invertebrates will serve as models for **Mr. George Marchand,** dioramist, who will make a reconstruction of the life of a Cretaceous sea as one of the ten groups planned for the hall .... **Mrs. June Buchwald,** guide-lecturer of the Raymond Foundation, prepared a script on "Furs Around the World" for the Women's Magazine of the Air television program over WGN-TV, presented last month .... **Mr. E. R. Blake,** Associate Curator of Birds, attended the annual meeting of the American Ornithologists Union at Buffalo as representative of the Museum from October 10 through 14 .... **Mr. Loren P. Woods,** Curator of Fishes, left on a brief trip to Washington, D.C., where he will aid in the packing up of manuscripts and specimens to come to the Museum in continuation of the long-continued co-operative work on the fishes of Panama in which the Museum and the Smithsonian Institution have been engaged since 1912.

Harris School Extension Service

The N. W. Harris Public School Extension prepares small portable cases containing natural-history and economic exhibits and lends them to the schools of Chicago. Approximately 1,100 cases are at present available for this educational work. During the school year two cases are sent to each school at frequent, regular intervals. Deliveries and collections are made free of charge by two Museum motor trucks. Examples of these cases are exhibited in Stanley Field Hall and also in an alcove of the north corridor on the ground floor. In addition to the cases, collections of study-skins of birds and small mammals, pressed plants of the Chicago area, specimens of rocks and minerals, and sundry other materials may be borrowed by schools.

Each year the Department of Botany sends thousands of photographic prints and accompanying labels from its large collection of negatives of type and historical specimens of American plants in European herbaria to other institutions and to botanists for study purposes and insertion in their herbaria.

An exhibit of important steel-making minerals is displayed in a special table case in Hall 36.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Anthropology:

From: B. T. Miller, Logansport, Ind.—18 ethnological specimens, Dutch New Guinea.

Department of Botany:

From: Dr. J. Merino Y Coronado, Caracas, Venezuela—10 herbarium specimens, Venezuela; Dr. F. G. Brieger, Piracicaba, Brazil—50 ears of Indian maize, Brazil; A. F. Wilson, Flossmoor, Ill., and Harold Nagle, Port Arthur, Tex.—4 wood specimens, New Zealand; Dr. Günter Tessmann, Curitiba, Paraná, Brazil—43 herbarium specimens, Brazil; Donald Richards, Chicago—1,512 specimens of algae, New Brunswick.

Department of Geology:

From: National Speleological Society, Washington, D.C.—26 cave mineral specimens, Virginia; G. F. Sternberg, Hays, Kan.—fossil bones of *Ctenochelys*, Kansas.

Department of Zoology:

From: Dr. Marshall Laird, Wellington, N.Z.—a lizard, Fiji Islands; Dr. Hans Schlesch, Copenhagen, Denmark—23 lots of South American land and freshwater mollusks; Maj. Lenox R. Lohr, Chicago—a diamondback rattlesnake; Walther Buchen, Chicago—230 bird skins, East Africa; Leslie Hubricht, Danville, Va.—48 salamanders, United States; H. Robin Mills, St. Petersburg, Fla.—a snake, Florida; Illinois State Museum, Springfield, Ill.—5 fishes, Cocos Island; Miss Edith Haas, Chicago—4 freshwater shells, Wisconsin; Harold Trapido, Panama, Republic of Panama—206 frogs, 194 lizards, and a snake, Central and South America; Dr. Fritz Haas, Chicago—119 shells and 2 salamanders, Minnesota; Alan and Bryan Patterson, Chicago—2 salamanders, Florida; Bryan Patterson, Chicago—6 freshwater shells, Illinois; Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Mont.—2 paratypes of a tick, Burma; Chicago Zoological Society, Brookfield, Ill.—a marmoset skin and skull, South America; Ronald J. Lambert, Zion, Ill.—a raccoon skin and skeleton, Wisconsin; Dr. D. C. Lowrie, Moscow, Ida.—a snake, 12 frogs, 8 tadpoles, and a series of frogs' eggs, United States.

Library:

From: Dr. Henry Field, Washington, D.C.; Dr. Gregorio Bondar, Bahia, Brazil; Karl P. Schmidt, Homewood, Ill.; Ministerio de Education, Instituto de Anthropologio e Historia, Publica de Guatemala; Boardman Conover and Dr. Fritz Haas, both of Chicago.

The services of a Museum guide-lecturer may be engaged, without cost, by clubs, conventions, schools, and other organized groups of ten or more people, for weekdays and Saturday mornings. Written request for this service should be made to the Director of the Museum at least one week in advance of the intended visit.

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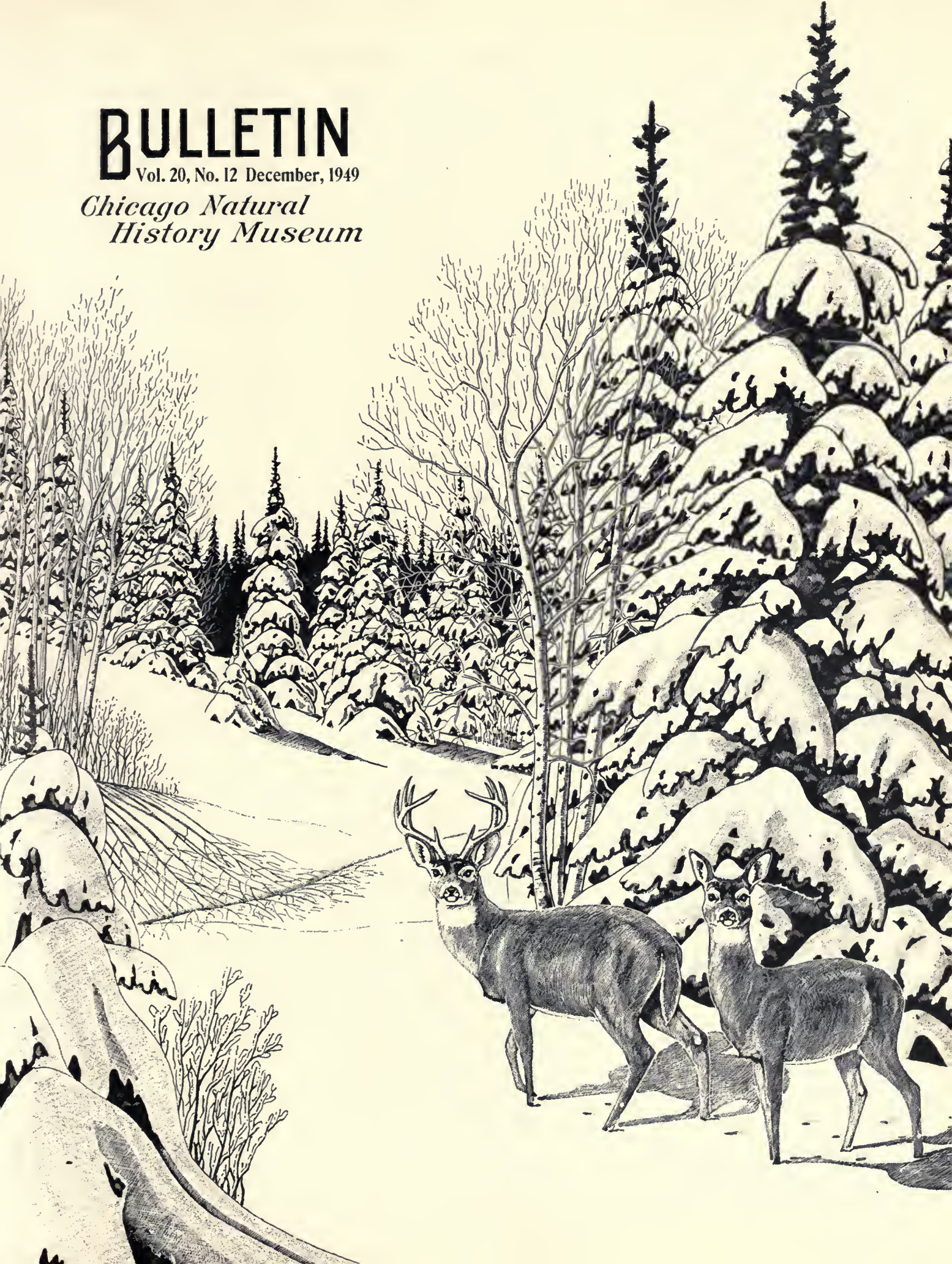

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Members are requested to inform the Museum promptly of changes of address.

CONSERVATION

So great have been the changes in the vegetation and animal life of the world with the spread of civilized man, that over wide areas the natural phenomena of geographic zoology and of ecology in general are completely secondary, approachable from the agricultural or economic standpoint rather than from the biological. The importance of the study of the conditions of life, undisturbed by the gross effects of civilization, has been increasingly appreciated in recent years. The principal hope for the preservation of natural conditions for the future, in temperate latitudes, and probably in much of the tropics as well, lies in the establishment of state and national parks, in which primitive conditions are maintained, to serve as refuges and sanctuaries for wild life.

It was a memorable experience for the junior author [Karl P. Schmidt] to find the great volcanic peak of Tongkoko at the northeastern tip of the Minahassa peninsula of Celebes, with its rich forest vegetation, dwarf buffalo and babirusa, black apes and tarsiers, mound builders, and flying lizards, set aside as a wild-life refuge by the government of the Netherlands East Indies, some time before 1929, and referred to as a "Natuur Monument." The vast Parc National Albert in the Belgian Congo and the Kruger National Park in the Transvaal are examples on a grand scale of such wild-life preserves in the tropics and subtropics. Throughout the world there has been a notable growth of appreciation of the aesthetic and other non-economic values of the untouched wilderness, exemplified in North America by the "Wilderness Society."

THOUGHTLESS WASTE

An expanding modern human culture like that of white man in North America or New Zealand tends to progressive and unthinking exploitation of natural resources without consideration of the long-term results; and unfortunately only too often there has been thoughtless waste of resources more valuable or more important than the short-term advantage gained. European agriculture and forestry had largely established a state of balance before the rise of modern mechanized agricultural techniques, and in older countries generally a kind of stabilization has long since been reached, though sometimes only after great losses of natural resources, as in the deforested and eroded areas of China. Even among many otherwise primitive peoples subsistence agriculture has reached a high state of development in which terracing of slopes may be carried to an extent impossible under an exploitative economy.

The fact that in unrenewable and renewable resources alike, the United States had been conspicuously thoughtless in its overall economy came to be realized, or at least to be publicized, only at about the beginning of the present century. The conferences called by President Theodore Roosevelt in 1908 and 1909 brought into focus the lines of thought involved in what we have come to think of as the "Conservation Movement" in North America.

LONG-RANGE PROBLEMS

The more far-reaching implications of the conservation movement in the United States concern long-range problems, the halting of waste, the stabilization of the renewable resources of water, soil, and vegetation, and, in general, taking thought as to man's long-range habitation of the earth's surface. In North America and in the parts of the world developed by white man only in the nineteenth century, the problems of substituting "development" for "exploitation" and of halting waste on public lands are acute. The need for wise conservation policies is recognized even in the most optimistic studies forecasting our economic and social future.

The questions as to the future expansion of human populations in the tropics, depending on the control of the specifically tropical diseases of man and of his domestic animals, and on the expansion of tropical agriculture, stumble on grave doubts as to the productivity of soils in regions of heavy rainfall. Consideration of the problems of soil resources and soil conservation on a world scale tend to be pessimistic and to emphasize the urgency of the problems facing all mankind in the further expansion of its populations and in its further conquest of the earth.

—(W. C. Allee and Karl P. Schmidt, in Chapter 28 of *Ecological Animal Geography*, 2nd Edition, by Richard Hesse, W. C. Allee, and Karl P. Schmidt, in press, by permission of John Wiley and Sons, Inc.). See suggested Reading List on Conservation below:

READING LIST

The following works, obtainable through The BOOK SHOP of the Museum, are recommended as an introduction to the subject of Conservation:

Bennett, H. H. 1947. *Elements of Soil Conservation.* New York, McGraw-Hill: pp. x, 406, illus.

Gabrielson, Ira. 1943. *Wildlife Refuges.* New York, Macmillan: pp. xiii, 257, 32 pls., 17 text figs.

Graham, E. H. 1944. *Natural Principles of Land Use.* New York, Oxford: pp. xiii, 274, 32 pls.

Gustafson, A. F., C. H. Guise, W. H. Hamilton, Jr., and Heinrich Ries. 1949. *Conservation in the United States,* 3rd Edition. Ithaca, Comstock: pp. ix, 254, illus.

Jacks, G. V., and R. O. Whyte. 1939. *Vanishing Lands: A World Survey of Soil Erosion.* New York, Doubleday-Doran: pp. 332, 33 pls.

Leopold, Aldo. 1936. *Game Management.* New York, Scribners: pp. xxi, 481, illus.

Mouton, H. G. 1949. *Controlling Factors in Economic Development.* Washington, Brookings Institution: pp. 389.

Osborn, Fairfield. 1948. *Our Plundered Planet.* Boston, Little, Brown: pp. xiv, 217.

Pinchot, Gifford. 1947. *Breaking New Ground.* New York, Harcourt Brace: pp. xvii, 522, illus.

Sears, P. B. 1947. *Deserts on the March,* 2nd Edition. Norman, University of Oklahoma Press: pp. xii, 180.

Vogt, William. 1948. *Road to Survival.* New York, Sloane: pp. xvi, 335, 8 figs.

THIS MONTH'S COVER

A Christmas card from the Museum to its Members is presented as this month's cover. This drawing introduces the work of Mr. Douglas E. Tibbitts, who was appointed Staff Illustrator on November 1.

Among the African mammals exhibited in Carl E. Akeley Memorial Hall (Hall 22) are groups of most of the well-known species of the continent of Africa. At one end of the hall is the largest habitat group in the Museum. It is a scene in southern Abyssinia that shows twenty-three animals of six different species gathered at a waterhole.

HOPI CHRISTMAS AND KACHINAS

By DONALD COLLIER
CURATOR OF SOUTH AMERICAN ETHNOLOGY AND ARCHAEOLOGY

OUR CHRISTMAS stems in part from the ancient winter solstice ceremonies of the Germanic peoples of northern Europe. Celebration of the winter solstice is found among many peoples throughout the world, and it is an important ceremony among the Hopi Indians of Arizona.

KACHINA DOLL
Representing one of the important supernatural beings of the Hopi.

The Hopi Soyal or winter solstice ceremony marks the beginning of the cycle of kachina dances, which lasts until the summer solstice. To the Hopis, kachinas are supernatural beings who live for half the year on the San Francisco Peaks near Flagstaff and on other high mountains. From late December until July they come to the Hopi villages and are impersonated in ceremonies and dances by masked men. It is believed that the prayers of the people are carried to the gods by the kachinas.

NINE-DAY RITUAL

The purpose of the Soyal ceremony, which lasts for nine days, is to usher in the kachina season, to welcome the kachina beings, and ritually to prepare the kivas (underground ceremonial chambers) for the entrance of the kachinas. The ceremony consists of rites in the kivas, the preparation of sacred prayer sticks that are placed as offerings at certain spots on the outskirts of the village, the performance of a masked dance, and the distribution of gifts of food and fruit.

It is at the kachina dances that kachina dolls are given by the masked dancers to Hopi children. Kachina dolls, which are so common in museum collections and are often seen in curio stores in the Southwest, are carved and painted representations of the marked kachina dancers. These are given not as toys but to be treasured and studied by the children so they may become familiar with the appearance of the different kachinas as a part of their religious education. Kachina dolls are hung in the household where they can be seen constantly.

SORT OF SANTA CLAUS

Harold S. Colton, who has made a special study of kachinas, has this to say about the meaning of these ceremonies: "Hopi children believe in kachinas just as our children believe in Santa Claus. In a kachina ceremony, the children are not supposed to recognize their fathers, uncles, or parents' friends who are disguised by masks and elaborate costumes. As Santa Claus comes at a certain season, bearing gifts to the children, so certain kachinas bring to the children kachina dolls, miniature bows and arrows, sweets, fruits, and other food. Hopi children enjoy a whole series of Christmas delights during the period from late December to July."

An authentic model of the altar used in the Soyal ceremony, as well as many fine examples of kachina masks and dolls, may be seen in the Hopi exhibits in Hall 7.

Organization of Exhibits

Any living thing or any inanimate object can exist in a multiplicity of relationships to other organisms, materials, and forces and, therefore, may be considered from many different aspects. Animals, for instance, may be regarded from the viewpoint of geography, of systematic series (taxonomy), and of association with other animals and plants in a particular environment (ecology), or in many other ways. The practical limitations of material and space prevent even the largest of museums from displaying all these facets of nature. Only fundamental facts and relationships can be shown for most types of material.

In this Museum, systematic series and geographic distribution form the principal plan of organization. Thus, mammals may be seen in systematic series in Hall 15, and many of the same animals may be seen again in other halls in association with different animals from the same continental areas. Realistic habitat groups serve to portray the typical environment of the species. Also, in appropriate places in these halls are topical exhibits designed to illustrate important biological principles.

MERRY CHRISTMAS and HAPPY NEW YEAR

The Museum will be closed on both Sunday, December 25, and Sunday, January 1 (Christmas and New Year's Day), so that Museum employees may spend the holidays with their families. These are the only days in the year when the Museum is not open. The Museum will be open as usual on Monday, December 26, and Monday, January 2.

SPRING FLOWERS IN LATE FALL

By JULIAN A. STEYERMARK
ASSOCIATE CURATOR OF THE HERBARIUM

Wildflowers usually are good indicators of the time of year in the northern hemisphere. Certain wildflowers start to bloom in the early spring and others follow in a seasonal parade of species whose bright colors adorn the landscape until the close of the flowering season. Usually the end of the flowering season is marked by the flowering of the shrub called eastern witch hazel (*Hamamelia virginiana*). This, along with late-flowering asters, goldenrods, gentians, ladies'-tresses orchids, and a few other late-flowering stragglers, normally brings autumn to an end.

However, during the latter part of this fall, as late as the middle of November, some early spring flowers bloomed a second time. Thus, the early-flowering liverleaf or hepatica (*Hepatica americana*), one of the first wildflowers to bloom in the spring, bird's-foot violet or pansy violet (*Viola pedata*), and even the golden bells or forsythia, one of the first shrubs to bloom in the spring, were found in flower during the first half of November.

ONLY THE HARDIEST BLOOM

This phenomenon of second blooming of some early spring flowering plants is by no means a rare one, as it has been observed

LIVERLEAF OR HEPATICA
This is the Hepatica americana, one of the early spring wildflowers of the Chicago region. This plant was found in bloom during November around the Barrington area.

at various times in past years when similar weather conditions prevailed. Neither all of the hepaticas nor all of the bird's-foot violets nor all of the forsythias bloom late, as only a few hardy plants belonging to these species send forth their blooms here and there in autumn.

The explanation for this out-of-season flowering may be found in (1) the comparatively mild autumn, almost free from killing

(*Continued on page 8, column 3*)

ARCHAEOLOGICAL SURVEY OF SONORA, MEXICO

By DONALD J. LEHMER
UNIVERSITY OF CHICAGO MUSEUM FELLOW IN ANTHROPOLOGY

THE Mexican (Sonora) Archaeological Expedition began field work early in February. The project was jointly sponsored by Chicago Natural History Museum, the University of Chicago, and Arizona State Museum. The field party consisted of the writer, Mr. Bryant Bannister of Yale University, and a jeep named Alice. We were fortunate in having Dr. Ernst Antevs, Research Associate in Glacial Geology, with us for ten days to study the geological exposures in which we had found archaeological material.

The expedition was organized to work on two related problems. We hoped to be able to determine the southern limit of the Cochise culture, a complex that first appeared in southern Arizona some 10,000 years ago, and we also hoped to find some trace of prehistoric contacts between the southwestern United States and Middle America.

INHABITANTS FRIENDLY

Sonora was strange country to us when we began our work, but we came to know it well in the four months we were in the field. The people were friendly and interested in our work. Some of our pleasantest memories are of the many friends we made—friends who ranged from the Director of the State Museum and the Secretary of the Interior to the old woman who keeps the coffee stall in the market at Navajoa and Antonio Varela who was our guide for several days near Estancia.

Sonora is a sparsely settled country, and we made our own camp most of the time. The back of the jeep carried our cots, bedrolls, extra gas cans, a change of clothes, and our excavation and recording equipment. There was a grub box and water can on the tailgate that made our kitchen. Part of our food was taken in from the United States, and the rest was bought in the markets of the towns we visited. The native coffee was particularly good, and one brand of cigarettes was very much like the United States variety. Once every week or so we made a point of spending a day in one of the larger towns where we could get a hotel room, a bath, and a change from our own cooking. We discovered that Sonora hotel beds are the hardest in the world.

HAMPERED BY FLOODS

During the first six weeks we were in the field we had a great deal of trouble because of the weather. In late January, Sonora had the worst series of floods it has experienced since 1890. Especially in the southern part of the state, roads were washed out, towns destroyed, and fields damaged. During February it rained a great deal, and as a result the rivers all ran bank-full. Bridges are almost unknown in Sonora, and even with the jeep we had difficulties with the stream crossings. On Valentine's Day we were the first car in sixteen days to cross the Rio Sonora into the town of Ures. By that time we had learned to respect the flooded rivers; so we made that crossing with the help of a team of four mules. There, and in other places, our Mexican friends were amazed at what the jeep could do in

MULE POWER AIDS 'HORSEPOWER'
Even a jeep needs help in getting around in parts of Mexico. Here the motor equipment of the Sonora Expedition is seen preparing to cross the flooded Rio Sonora.

rough country, and their favorite remark after a spectacular bit was: *"Que caballo!"* (whatta horse).

In the southern part of the state we crossed the larger streams on *pongos*. A *pongo* is a flat-bottomed barge used as a ferry, with an arrangement of ropes and cables that allows the current to carry it across the stream. Crossing on a *pongo* is a minor social event. The boat is always on the wrong side of the river, and it takes some time to bring it across. Some enterprising soul keeps a small brush shelter near the landing, where there are soft drinks and coffee on a charcoal brazier made of a five-gallon gasoline can.

EVERYTHING BITES, STINGS, OR JABS

Sonora is the very northwestern corner of the Mexican mainland. It lies between the Gulf of California and the rugged peaks of the Sierra Madre Occidental. The area along the coast is very flat and has a heavy cover of mesquite and cactus. One resident American told us: "Down here everything that doesn't bite or sting has thorns on it." Farther inland the country becomes broken, with narrow stream valleys deeply incised between the hills. In the eastern part of the state the mountains begin. Sonora is a dry country. Most of the part through which we traveled is brown and stony, and the only colors are those of the leaves of the desert shrubs and the deep blue of the sky. The stream valleys, fertile and heavily cultivated, make vivid slashes of green across the desert landscape. Along the Gulf coast are lines of glistening sand dunes between the purple of the sea and the brown of the inland plain.

Outside the cities there are some ranches, but most of the people are small farmers with a few fields in the stream valleys. The commonest house is a low adobe structure with three or four dark and airless rooms and a deep covered porch. This porch is the place where the family really lives. There is usually an open fire on an adobe platform, a table and a few chairs are scattered about, and two or three folding canvas beds lean against the wall. There is always an *olla*, a porous pottery jar for drinking water, either hung from the roof or resting in the crotch of a three-pronged post set in the floor. When visitors arrive, they are given chairs, and in a few minutes the fire has been stirred up and coffee is ready. The grown men sit and talk to the company, and occasionally the older women join in the conversation. The young women and the children stand off and stare from a little distance, the family dogs and chickens wander about underfoot, and occasionally an inquisitive pig snuffles his way into the porch.

We depended a great deal on local information to aid in finding the sites for which we were looking. In some cases the people had never paid any particular attention to the local archaeology. In others they were very interested and were able to guide us to a number of sites. Around Estancia, just south of Moctezuma, there were a number of late sites from which the local women made a practice of collecting the old metates to use in their own kitchens.

TRAVERSES 5,000 MILES

The archaeological survey we made produced some very interesting information. Altogether we traveled nearly 5,000 miles, most of them in the jeep but occasionally on horseback when the country was too rough. We concentrated mainly on four sections of the state: the valley of the Rio Sonora, upstream from Hermosillo; the Arroyo Zanjon, a northern tributary of Rio Sonora; the Gulf coast in the vicinity of Estero de Tastiota; and the Arroyo Cuchujachi, in the very southern part of the state.

We were interested in locating very early sites and, in many ways, Sonora was a disappointment from that point of view. As a rule, early sites that were located in the open have been buried by subsequent deposition. It is impossible to locate them unless they are in the process of being uncovered by contemporary erosion. Unfortunately for archaeologists, there is comparatively little erosion in Sonora today. There are very few deep arroyo channels such as one finds in Arizona and New Mexico, and areas of sheet erosion are small and localized. However, we were able to locate non-pottery sites in all of the sections in which we worked. Evidence for dating them is still rather scant, but it seems doubtful that any of them represent a period

earlier than about 1000 B.C. The artifacts from these sites consist of large numbers of grinding tools and some chipped stone pieces. There are a number of typological similarities to the pieces from the later Cochise horizons, and it seems likely that there is some relationship between the two complexes.

In several places we were able to obtain stratigraphic evidence that the non-pottery sites were earlier than the pottery horizons in the area. There appear to be several traditions represented in the pottery from Sonora. In the northwestern part of the state, the majority of the sites yield sherds of the Trincheras wares. These are particularly interesting as they seem to be the only painted types that are native to Sonora. Pottery from the rest of the state was unpainted, although a few sherds showed textured decoration of different sorts. There also appear to be at least two basic traditions in the unpainted pottery. That in the northern part of the state is an unpolished brown ware; that from the southern part consists of polished brown and polished red-slipped wares. One of the most perplexing problems that our work raised was the lack of painted pottery throughout most of Sonora. Contemporary groups to the north in Arizona, to the east in Chihuahua, and to the south in Sinaloa all made painted pottery. Why the tradition of painting pottery never caught on in Sonora is a question that certainly deserves some study.

One of the most interesting facts we gathered is that pottery is apparently quite late in most of Sonora. Pottery making is one of the first steps on the road to an advanced culture. It is a trait that appeared in the Southwest by A.D. 1. Most archaeologists believe that it is a trait that diffused north from Mexico, and we had hoped to find traces of that diffusion in Sonora. Instead, it appears that pottery is quite late in the sections we worked. Granting the hypothesis that pottery making and other traits did diffuse north from Mexico, we can say that, on the basis of our work, the diffusion did not follow the drainage of the Rio Sonora.

A great deal of work remains to be done in Sonora before we have anything approaching a comprehensive picture of the archaeology of the area. It still seems to be the most likely region through which movements between the Southwest and Mexico could have passed. Our work left large sections of the state untouched, and it seems likely that work along the coastal plain and among the caves in the Sierra Madre would produce some very valuable information.

Noted British Scientist Here

One of Great Britain's most noted scientists, Dr. William E. Swinton, of the Department of Geology of the British Museum (Natural History), in London, was a visitor at Chicago Natural History Museum for several days last month. He consulted with members of the Division of Paleontology and the Division of Mammals.

FIFTY YEARS AGO AT THE MUSEUM

Compiled by MARGARET J. BAUER

With the closing of the 19th century the work of reinstalling the East Court of the Field Columbian Museum building was completed. The Court was devoted exclusively to archaeology, which was at that time sharply distinguished from ethnology.

Every case in the Court had been entirely reclassified during reinstallation. The north

Eskimo returning from seal hunt. This life-size group may now be seen in Joseph Nash Field Hall (Hall 10).

alcoves were devoted to the archaeology of the United States and Canada, the central portion to the archaeology of Mexico and Central America, and the south alcove to South American archaeology.

There was much activity also in ethnological exhibition. Objects formerly in the East Court were reinstalled, and much new material was placed on exhibition.

DAWN REDWOOD PLANTED ON WEST COAST

Last summer an exhibit of dawn-redwood material from the type locality in China, together with fossil redwoods and other related material, was placed on exhibition in Stanley Field Hall of the Museum by the Department of Botany. An article by Dr. Theodor Just, Chief Curator of Botany, about the discovery of the dawn redwood ("Shui-Hsa") and its botanical relations with extinct and living species of redwoods appeared in the Museum BULLETIN (*July, 1949, page 3*). The article told of the work of Professor Ralph W. Chaney, of the University of California, who studied the dawn redwood in the area of China where it is still growing—about 140 miles northeast of Chungking—and who is the only American botanist who so far has had this opportunity.

An interesting follow-up to this is the United Press dispatch that was published in various newspapers last month:

BERKELEY, Calif. (UP), Nov. 15—Hundreds of seedlings of the dawn redwood, an ancient Chinese tree, have been transplanted along the Pacific Coast from Alaska to Guatemala.

The dawn redwood previously was believed to have become extinct 20,000,000 years ago, but recently living specimens were discovered in the remote interior of China.

University of California scientist Ralph W. Chaney went to China and brought back four seedlings and thousands of seeds, which he sent to former students and colleagues to plant in their neighborhood.

Thirty million years ago, the dawn redwood grew on the Pacific Coast. It is a cousin of the giant California redwoods.

HOW TO DO CHRISTMAS SHOPPING FROM YOUR EASY CHAIR AT HOME

Chicago Natural History Museum offers two Christmas plans that eliminate any necessity to fight your way through shopping crowds or to be burdened with the preparation of parcels:

(1) Christmas Gift Memberships

Send to the Director the name and address of the person to whom you wish to give a Museum membership, together with your remittance to cover membership fee or dues.

An attractive Christmas card notifying the recipient that through your generosity he has been elected a Member of the Museum will be sent, together with membership card or certificate and information on membership privileges.

(2) Museum Book Shop Gifts

Books endorsed for scientific authenticity by members of the Museum staff are on sale in the BOOK SHOP. The selection is for both adults and children.

Where desired, the BOOK SHOP will handle mail and telephone (WAbash 2-9410) orders and will undertake all details of wrapping and dispatching gift purchases to the designated recipients, together with such personal greetings as the purchaser may specify.

The Bird Page . . .

SNAKE-SKIN LININGS IN BIRDS' NESTS

By AUSTIN L. RAND
CURATOR OF BIRDS

THERE are occasionally discovered behavior patterns of birds (habits of birds, an earlier generation of naturalists used to call them) that are so unusual as to make one stop and wonder. They are unusual for birds generally, but in a species here and there they are the regular thing. Such is the placing of a shed snake skin in their nests by some birds.

A bird like the English sparrow, or the road runner, that uses a variety of material coarse or fine, would be expected to use shed snake skins occasionally, as it came across them. But there are a number of species that seem to use snake skins regularly in their nests. It would seem that the birds deliberately sought out the skins for this purpose, as though they were as much a part of the nest as the mud in the bottom of a robin's nest or the fresh green grass-heads ornamenting the entrance to some weaver birds' nests.

SOME HABITS BAFFLING

I have long since given up thinking that every aspect of a bird's life must serve a useful purpose. Indeed, I can point out some definite maladaptations. But usually every type of behavior has a logical origin. By considering its occurrence in various species and against the background of the bird's everyday life, some correlations usually can be found. But this doesn't seem to work with the use of snake skins in nests.

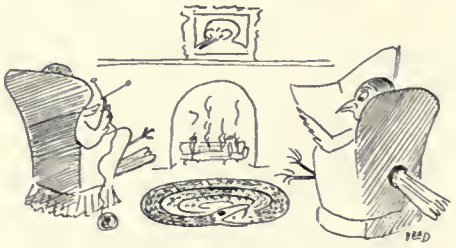
The list of birds habitually using snake skins in their nests is short, as follows:

1. Great-crested flycatcher—belonging to the New World flycatchers, breeding in eastern North America and nesting in holes.
2. Arizona crested flycatcher—a relative of the great-crested variety, with similar habits.
3. Blue grosbeak—an American member of the sparrow family, making an open nest in bushes.
4. Black-crested titmouse—a member of the chickadee family, living in western North America and nesting in holes.
5. Bank mynah—a starling, living in southern Asia and nesting in holes in banks.
6. Rifle bird—an Australian bird of paradise, making a cup-shaped nest in trees.
7. Madagascar bulbul—making a cup-shaped nest in trees.

LIKE A DECORATION

Twenty or more other species of birds have been recorded as using snake skins more or less commonly, or occasionally, perhaps on the basis of availability or of chance. But with the above they're an essential part of the nest. In some of the species the snake skins are arranged as a rim around the edge of the nest almost as a decoration; sometimes the snake skins may make up most of the nest.

Now as to possible correlations. The species are not closely related. Except for the two flycatchers, the other five represent five different families. The distribution over the world is wide, too: America, Asia, Madagascar, Australia. Various explanations for the behavior have been advanced. It has been suggested that it's correlated with hole-nesting, but three of the seven do not nest in holes. The most common theory is that it's to frighten away possible predators by making them think there is a snake in the nest. However, this is not very likely, and, too, one wonders why the birds that use the snake skin are not frightened themselves. Indeed, one writer, surely not seriously, has suggested that the fright in early life of crested flycatchers at finding a snake skin in the nest accounts for the upstanding crest in this species!



'BURGLAR ALARM' THEORY

Another suggestion is that the snake skin, by the rustling noise it makes when touched, acts as an alarm bell or a burglar alarm to warn the rightful occupants of the nest when an intruder approaches. This also seems a rather weak explanation.

We are left, then, with the fact that this curious habit has been developed in a few birds, not closely related, that live in various parts of the world and that have very different habits. It is usual with them. A number of others occasionally have this habit. As to what its significance is we have no idea.

EXTINCT BIRDS ACQUIRED IN LAYSAN COLLECTION

Three extinct birds are included in a Laysan Island bird collection made by Commodore George B. Salisbury years ago and transferred to Chicago Natural History Museum by the University of Missouri and Colonel Sam T. Salisbury.

The collection, totaling some 22 species, was originally presented to the University of Missouri. When Professor Rudolf Bennitt initiated a course in ornithology there, he found this well-made, well-preserved, and well-cared-for collection. But Pacific Island birds did not fit into any scheme of collegiate activity that he could envisage, and, recognizing the scientific value of this fine collection, he thought it would be more appropriately housed in one of the larger museums with an active interest in birds of the world.

Professor Bennitt at once thought of Chicago Natural History Museum and wrote to ask if we were interested. Indeed we were. Then he wrote the donor of the collection, Commodore Salisbury, to see if such a program would meet with his approval. Both Commodore Salisbury and his brother, Colonel Salisbury, agreed to the proposal that the collection become a part of this Museum, and our collections are now enriched by this important representation of Laysan Island birds.

Laysan Island is American territory, a tiny islet in the Hawaiian Archipelago. The Museum has a habitat group portraying the two species of albatross, the frigate bird, and other oceanic birds there, which are spectacular and for which the island is famous. But it is also famous for its endemic land or fresh-water birds: a Laysan teal, rail, finch, miller bird, and two honey creepers. The Laysan Island birds have had more than their share of vicissitudes: the introduction of rabbits, the depredation of Japanese plume hunters and guano seekers—but especially the rabbits. The seabird colonies were ravished, but these birds nested elsewhere as well. The small endemic land birds, however, were found nowhere else. As a result of the introduction of rabbits, four species disappeared from Laysan. They are gone forever to join the growing list of birds and other animals that have become extinct in historic times. Such extinct forms can now be known from the specimens carefully housed in museums.

The most brilliant of the extinct trio just received is the Laysan Island honey creeper. It is small, the size of a sparrow, but clad in scarlet feathers, with only the wings, tail, and belly duller and brownish. Its bill, as one would expect in a honey creeper, is somewhat elongated, curved, and fairly slender. The miller bird, one of the Old World warblers, by contrast is dull indeed. It is pale olive above and pale yellowish below, about the same size as the honey creeper but with a straight bill and a longish tail. The Laysan rail is also small and dull. It's only about 5 inches long, sooty or brownish on the underparts, and olive, streaked with blackish, above.

Dodo Model

"Dead as a dodo" is an adage. The dodo, a strange, flightless relative of the pigeons, was confined to a single small island in the Indian Ocean. It became extinct within a century after the discovery of the island in 1598. A model of the dodo may be seen among the exhibits in Hall 21.

CAGE-BIRD WATER COLORS BY KARL PLATH

Through the generosity of the Walter Brewster family, Chicago Natural History Museum has become the owner of a series of twenty-five exquisite little water-color paintings of cage birds by Mr. Karl Plath, noted artist and Curator of Birds at the Brookfield Zoo. The paintings were made from life some years ago when the late Mrs. Walter S. Brewster acquired the birds with the aid of Mr. Rudyerd Boulton, former Curator of Birds at the Museum. The birds were kept in two large cages on the sunporch of the Brewster home in Lake Forest, and the paintings were framed at one end of the porch as a means of identifying the birds.

The variation in the coloring of the series runs the whole gamut of the color chart, from the lovely all-white Japanese white bengalei to the South American all-black Jacarini finch. From India are pictured the green avadacrat, all green except for a

ONE OF THE KARL PLATH PAINTINGS

yellow spot above the tail and black-and-white striped sides; the spice finch, cinnamon colored, with a white breast latticed neatly with cinnamon; and the strawberry finch, whose red body is speckled with white dots that resemble the seeds on strawberries, while his demure little brown mate is distinguished by a few white spots on each wing. From China comes the Pekin robin, a little brown bird with a yellow throat and robin-red breast band and wing spots. The Siberian goldfinch, chestnut, black, white, red, and bright yellow all on one bird, is a cage bird that anyone would delight in owning. Among the six African birds, each one a striking flash of color, is the fascinating paradise whydah, a veritable Cinderella. During most of the year it resembles a faded sparrow; then it blossoms out into glossy black with a beautiful black flowing tail, 6 inches long, a white vest, and a bright orange-red breast band for the mating season.

Many of these birds can be bought on the market, and they reward well the effort of their care. They are gay and friendly and decorative, although they do not sing like canaries or talk like parrots. They are easier to care for than parrots or parakeets, which require a great deal of attention. Parrots can literally die of loneliness. If you have the time for it, a single parakeet (love bird) is a wonderful investment, because instead of lavishing its affection on another parakeet it will transfer its loyalty to you; but it may die if you neglect it. Not so the little finches pictured by Mr. Plath. Water, food, a clean cage, and they will flit about like jewels, showing off their bright colors—catching and intriguing the eye of the artist.

The pictures were given to the Museum in memory of Mrs. Brewster by her son, Mr. Edward T. Brewster, and her daughter, Mrs. Sarah Brewster Hodges. They may be seen in the Museum Library.

ELLEN T. SMITH
Associate, Birds

STAFF NOTES

Bryan Patterson, Curator of Fossil Mammals, **Dr. Rainer Zangerl,** Curator of Fossil Reptiles, and **Dr. Robert H. Denison,** Curator of Fossil Fishes, attended the meetings of the Society of Vertebrate Paleontology (a section of the Geological Society of America) held in El Paso, Texas, November 9–11. They took part in discussions and presented papers on their respective subjects. On their way back, on the basis of information obtained at El Paso, they engaged in excavations in another part of Texas for marine Cretaceous reptiles and mammals.... **Douglas E. Tibbitts** was appointed Staff Illustrator on November 1. Mr. Tibbitts, whose home is in Reedsburg, Wisconsin, is a graduate of the University of Wisconsin, where, after receiving his bachelor's degree, he worked in the Department of Zoology on anatomical drawings of fishes. For the past year he has been engaged in anatomical drawings for the Department of Zoology of this Museum. He is an Army veteran who served forty months overseas as a first sergeant with the Combat Engineers.... **Colin C. Sanborn,** Curator of Mammals, lectured recently to a zoology class at the University of Illinois on "The External Characters of Bats" and to the Ecology Club on "Ecology of the Tapir."

Books

(All books reviewed in the BULLETIN *are available in The Book Shop of the Museum. Mail orders accompanied by remittance are promptly filled—The Book Shop pays the postage on shipments.)*

FOR CHILDREN'S CHRISTMAS

ANIMAL BABIES. By Margaret Jean Bauer. Illustrated by Jacob Bates Abbott. M. A. Donohue and Co., New York and Chicago, 1949. 88 pages, 12 full-page color plates, 58 marginal drawings. Price $2.

The pictures alone in this book about baby animals would make it a welcome addition to the library of any child between eight and twelve. There are twelve charming full-page colored illustrations and more than fifty attractive marginal drawings. But the text also will make a strong appeal to children. It contains much authentic and interesting information. From it, for example, the reader will find out what the largest animal baby in the world is, why a baby porcupine must protect its nose, how a young hippopotamus apparently can stand on the surface of the water in a stream, and how a mother sloth serves as a hammock for her baby.

PRESENTS BASIC IDEAS

In addition to presenting a great many interesting facts, the book also introduces some of the basic ideas about animal life. From the chapters "Water Babies," "Tree Babies," "Ground Babies," "Babies Under the Ground," and "Desert Babies," the reader sees that animals are fitted in various ways for living in the environments in which they are found. From the chapter "Protection" he sees that animals have various protective adaptations. From "Lessons" he learns that among the lower animals not all behavior is inherited—that other baby mammals have lessons to learn, just as human babies have.

The chapter "Orphans" presents material not often found in children's books except in the accounts of individual animals. It is sure to hold the interest of the reader.

Throughout the book the author has been careful not to write down to her audience. She has thus widened the age range for which the book is appropriate. In a few places, as in the story of how Mrs. Comstock as a child was "adopted" by a cat, the style and vocabulary are rather advanced. But in the main the book is very readable. It is a worthy member of the series of natural-history books of which it is a part.

BERTHA MORRIS PARKER
Chairman, Science Department, Laboratory School,
The University of Chicago

DECEMBER LECTURE TOURS DAILY EXCEPT SUNDAYS

Tours of exhibits, under the guidance of staff lecturers, are conducted every afternoon at 2 o'clock, except Sundays and certain holidays. On Mondays, Tuesdays, Thursdays, and Saturdays, general tours are given covering all departments. Special subjects are offered on Wednesdays and Fridays; a schedule of these follows:

Fri., Dec. 2—The Dynamic Earth—How the Earth's Surface Changes. Illustrated introduction in Meeting Room (*Anne Stromquist*).

Wed., Dec. 7—Fur-bearing Animals (*Lorain Farmer*).

Fri., Dec. 9—Sacred Animals. Illustrated introduction in Meeting Room (*Jane Sharpe*).

Wed., Dec. 14—Our Human Family—Race and Culture of Living People (*Harriet Smith*).

Fri., Dec. 16—The Earth's Green Mantle. Illustrated introduction in Meeting Room (*Marie Svoboda*).

Wed., Dec. 21—Fashions in Furs (*June Buchwald*).

Fri., Dec. 23—The Year's Record in Trees. Illustrated introduction in Meeting Room (*Miriam Wood*).

Wed., Dec. 28—Animals in Art (*Jane Sharpe*).

Fri., Dec. 30—Jewelry—Ornamental Materials and How They Are Worn. Illustrated introduction in Meeting Room (*Harriet Smith*).

Persons wishing to participate should apply at North Entrance. Tours are free.

There will be *no tours* on *Saturday, December 24* (Christmas Eve), and *Saturday, December 31* (New Year's Eve), but the Museum will be open to visitors on those days. The Museum will be closed on Christmas and New Year's Day.

GIFTS TO THE MUSEUM

Following is a list of the principal gifts received during the last month:

Department of Botany:

Dr. Grace C. Madsen, Tallahassee, Fla.—44 specimens of marine algae, Florida; Dr. R. L. Caylor, Cleveland, Miss.—22 specimens of algae, Mississippi; Dr. Richard Evans Schultes, Cambridge, Mass.—182 herbarium specimens, Colombia and Brazil; Donald Richards, Chicago—17 large lots of mosses, New Zealand.

Department of Zoology:

From: Messias Carrera, São Paulo, Brazil—50 robber flies, including 31 determined species and 2 paratypes, Brazil; Chicago Zoological Society, Brookfield, Ill.—an echidna and a two-toed sloth; Boardman Conover, Chicago—142 birdskins, Paraguay; Henry S. Dybas, Hazelcrest, Ill.—1,808 insects and 50 dermestid beetles, United States, Colombia, Saipan, and the Marianas; Laura Brodie, Chicago—96 reptiles and amphibians, 35 insects and their allies, and 10 specimens of crayfish and slugs, South Carolina; William J. Beecher, Chicago—248 insects, Solomon Islands; Leander J. McCormick, La Fontanette, St. Tropez, France—101 specimens of fish (about 28 species), Mediterranean Sea, St. Tropez, France; Samuel Edgar, Papeete, Tahiti—43 insects, the Marianas; Dr. A. J. Nicholson, Billings, Mont.—one bat, Montana; Mrs. Lily Hefferan, Winnetka, Ill.—a birdskin, Kenya Colony; Mrs. F. Lind Petersen, Finca El Zapote, Zapote, Escuintla, Guatemala—3 elephant beetles, Guatemala; Raymond Jablonski, Milwaukee, Wis.—4 insects, Japan; Dr. Victor Dropkin, Chicago—84 insects and allies, Texas; Dr. Donald C. Lowrie, Moscow, Ida.—251 insects, United States; Alexander K. Wyatt, Chicago—53 insects and 2 spiders, United States; Dr. Charles H. Seevers, Chicago—120 insects and allies, United States and Mexico; Coleman A. Foster, Johannesburg, Union of South Africa—19 bats, Portuguese East Africa, Innaca Islands, in Delagoa Bay; Florence Mott, Benton Harbor, Mich.—2 hornet or yellow-jacket nests and 25 book lice, Michigan.

Library:

From: Agnes McNary, Chicago; K. Hatai, Institute of Geology and Paleontology, Tahoku University, Sendai, Japan; Elmer S. Riggs, Siloam Springs, Ark.; Alexander Spoehr, Winnetka, Ill.

NEW MEMBERS

The following persons became Museum Members between October 17 and November 15:

Contributors

Walther Buchen

Associate Members

Gilbert E. Gustafson, W. J. Halligan, Wilson O. Koehnlein, Frank W. Schwinn.

Non-Resident Associate Members

James Edwards Trott

Annual Members

Wells T. Albade, D. D. Alderdyce, Roy E. Bard, Robert C. Bennett, Jr., Joseph E. Bonk, W. A. Bowersox, Edvin Brye, Arthur M. Cox, Paul Curtis, Tom Dolan, Mrs. Cecil James Downs, Mrs. A. Bradley Eben, Joseph F. Fiala, Joseph J. Golman, Warren S. Hassell, Henry Hooper, Jr., John M. Knowlton, Russell J. Leander, Samuel Leland, I. H. Mahler, Dr. Gilbert H. Marquardt, Miss Edna W. McCloud, Lee N. Parker, Dr. Henry B. Perlman, H. R. Peterson, Wayne S. Pike, W. Saarinen, M. G. Schoch, Sam Sciaky, Jeffrey Shedd, George C. Slifka, John T. Snite, William M. Stoddart, Nicholas J. Vander Kloot, Mrs. Leota Gregory Wholey, John T. Williamson, Carl Zimmerman.

The Melanesian collection in Hall A is the finest and most complete in the world.

SPRING FLOWERS IN LATE FALL

(*Continued from page 3*)

frosts, and (2) short-length days at this time of year. Miss Dorothy Davis of the Chicago Division of the United States Weather Bureau has supplied the following data on the average temperatures for the months when these flowers are ordinarily in bloom in March, April, and May, and for those during October and November. In Chicago, the average temperature for October is 52.5° F; for November, 37.7° F; for March, 34.5° F; for April, 46.9° F; and for May, 57.8° F. This year the average for October was 57.2° F, or almost 5° above average, and for November of this year the average has been, at the time of this writing, 16° above average. A comparison of these figures shows that the average temperatures of November and March are fairly close, while those of October are intermediate between those of April and May. In other words, the amount of heat to which the early spring flowers respond when blooming during March and April is similar to the conditions that prevail during October and November.

Furthermore, a comparison of the total hours of sunshine reveals additional interesting data. During March the mean number of hours of sunshine for the Chicago region is 370 hours and 2 minutes; for April, 400 hours and 8 minutes; for July, 460 hours and 6 minutes; for August, 428 hours and 9 minutes; for September, 374 hours and 5 minutes; for October, 343 hours and 3 minutes; and for November, 295 hours and 4 minutes. It is easily seen that the number of hours of sunshine decreases after July, but that the values for the months of March and October are fairly close, as are those of the months of September, March, and April. These early spring flowering plants find it favorable to bloom during the short-length days instead of during the long days of summer. Thus, it is natural for them to respond to similar light conditions in autumn, when the shorter-length days of October and November approach those of March and April.

Moreover, in the early spring these early-flowering species bloom before the leaves have budded out from the trees and shrubs of the woodland because more sunlight is available to them than later on, when the trees and shrubs have attained full leafy development and provide more shade. But in late October and November, after the trees and shrubs have dropped their leaves and the sun rays again filter in to these plants, an approach to the conditions of early spring exists. It is not surprising, therefore, in view of the above considerations of shorter day-lengths, somewhat similar temperatures, and relative amount of sunshine, that the early spring flowers may be found occasionally in bloom in the late fall.

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